

THE INDUSTRY'S RECOGNIZED AUTHORITY

July 1945

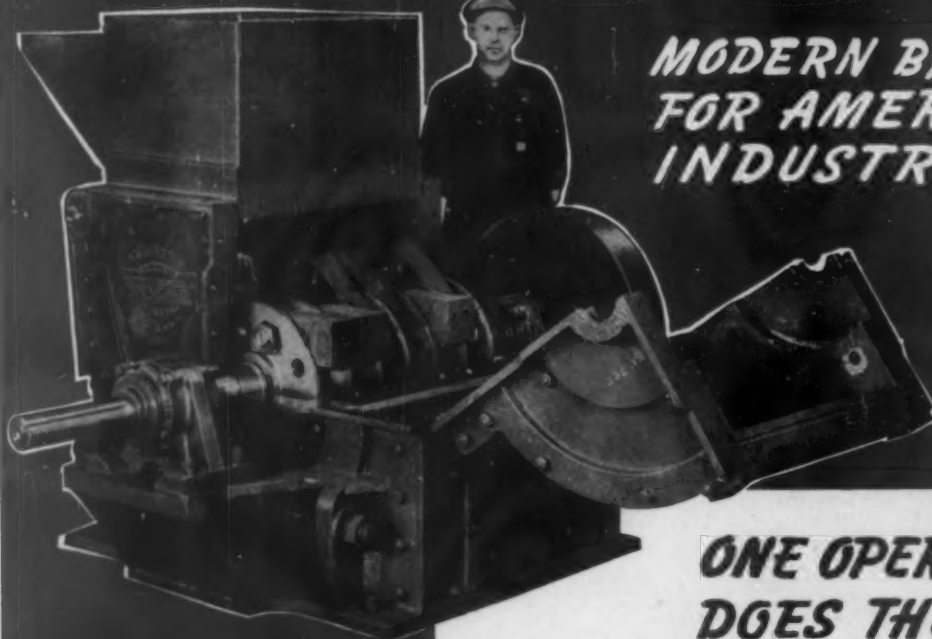
ROCK PRODUCTS

CEMENT • SAND AND GRAVEL • CRUSHED STONE • SLAG • LIME • GYPSUM
READY MIXED CONCRETE • CONCRETE PRODUCTS • INDUSTRIAL MINERALS



GLASS—Expanding Outlet for Silica and Lime

SPEED



**MODERN BY-WORD
FOR AMERICAN
INDUSTRY.....**

ONE OPERATION DOES THE JOB

SPEED plus satisfactory work is essential in America today. Along these lines the Williams "Slugger" Crusher and Pulverizer now makes it possible to crush large pieces of stone weighing from 75 to 100 pounds to $1\frac{1}{4}$ ", $\frac{3}{4}$ " or agricultural limestone in One Operation. This not only eliminates costly slogging but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of crushing equipment on the market today, and with seven sizes to choose from, producing from 4 to 30 tons per hour, every producer whether large or small can now afford to install a Williams.

Outstanding "Slugger" Features

- **MANGANESE STEEL HAMMERS.** Heavy Duty Slug End Hammers are standard equipment in the "Slugger."
- **HAMMER ADJUSTMENTS OVER-COME WEAR.** Discs are arranged so that the hammers can be set out as they wear on the end.
- **MANGANESE STEEL ADJUSTABLE BREAKER PLATE.** Adjustable towards the hammers.
- **ELECTRIC STEEL FRONT END.** The part which holds the breaker plate is electric steel casting— $3\frac{1}{2}$ times stronger than cast iron.
- **COVER LINERS 1" THICK.** Manganese steel liners.
- **SIDE LINERS 1" THICK.** Manganese steel liners.
- **SEVEN SIZES.** 30 to 150 horse power, stationary or portable models.

THE WILLIAMS PATENT CRUSHER & PULVERIZER CO.

800 ST. LOUIS AVE.

ST. LOUIS, MO.

**WILLIAMS FINE GRINDING
EQUIPMENT WITH AIR
SEPARATION**



This machine is used for grinding of limestone, stone, and other materials. It is a Williams Patent Crusher and Pulverizer Co. product. It is designed for fine grinding and air separation.

Williams Patent Crusher and Pulverizer Co. is the only company in the world that can grind and separate materials in this way. It is a Williams Patent Crusher and Pulverizer Co. product.



PATENT CRUSHERS, GRINDERS, SEPARATORS

"TOUGH" HANDLING JOBS MADE EASY WITH LINK-BELT CONVEYORS

● Here's an excellent example of solving a "tough" handling job at the Warner Co.'s Cedar Hollow plant. The problem was how to get enormous lumps of limestone blasted from quarry face, into primary crusher at a uniform rate, with prompt release of quarry trucks, and without choking or stalling the crusher. Link-Belt engineers worked out a system and installed a specially designed apron conveyor, 5-ft. wide and 60-ft. centers, inclined 25° from horizontal, with a capacity of 300 T.P.H. The hopper was built to withstand the terrific impact of 14 tons of rock dumped from truck. Lumps measuring 4 to 6 ft. across and weighing 2½ tons are handled. Crushed stone is fed uniformly by a reciprocating feeder to a belt conveyor extending to secondary crusher.

Check your materials handling and power transmission machinery plans with Link-Belt engineers.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40,
Atlanta, Dallas 1, Minneapolis 5,
San Francisco 24, Los Angeles 33,
Seattle 4, Toronto 8.
Offices in principal cities.



Illustrating conveyor apron, bottom of truck dump hopper, and the takeup bearings which support the conveyor foot shaft.



14-ton load of limestone, ready for dumping into receiving hopper of inclined Link-Belt apron conveyor feeding the primary crusher, located nearby on quarry floor.



View of fully loaded Link-Belt apron conveyor from truck dump hopper to primary crusher. Large lump in foreground measured 6-ft. across. In background is inclined belt conveyor delivering crushed stone to secondary crusher.

LINK-BELT CONVEYORS

PREPARATION EQUIPMENT . . . POWER TRANSMISSION MACHINERY

OTHER LINK-BELT EQUIPMENT INCLUDES:
Complete Sand, Gravel and Stone Washing Plants . . .
Ready-Mixed Concrete Plant Equipment . . . Lime
Handling Equipment . . . Screens (vibrating, rotary
and conical) . . . Washers and Classifiers of the screw,
log, flight, Shaw and conical types . . . Dewatering
Rotoscopes and Screw Conveyors . . . All Types of
Elevators and Conveyors . . . Roto-Louvre Dryers and
Coolers . . . Skip Hoists . . . Car Spotters . . . Portable
Conveyors and Bucket Loaders . . . Silent and Roller
Chain Drives . . . Speed Reducers . . . Variable Speed
Transmissions . . . Chains (Malleable Iron, Promal and
Steel) . . . Sprockets . . . Elevator Buckets . . . Gears
Clutches . . . Couplings . . . Self-Aligning Ball and
Roller Bearing Units . . . Babbitted Bearing Units,
etc. Catalogs on request.

9007

PREFORMED WIRE ROPE DESERVES TO BE HANDLED WITH CARE. SEE WHAT ACTUALLY HAPPENS IN THESE CROSS-SECTION VIEWS.

GRIP...or



Laughlin "Fist-Grip" Safety Clip holds rope firmly by friction — with hardly any flattening.

CRUSH?



Ordinary U-bolts crush wires, frequently ruining rope ends. (Notice distorted hemp center under "U".)

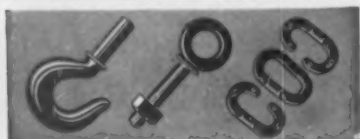
(Nuts tightened to same tension with torque-indicating wrench in both cases)

"Fist-Grip" Clips protect your rope. 25% fewer can be used, because improved bearing surfaces deliver full rope power. They save time, too, because they go on faster—with any type wrench—and can't be put on backwards. They are the only clips with drop-forged bolts. Order test samples from your distributor today.

Distributed through mill, mine and oil field supply houses. For a complete catalog on Laughlin's wire rope and chain hardware, write to Dept. 4, The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS



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2

450
8

In war or peace
B.F. Goodrich
 FIRST IN RUBBER

38



New glass and rubber belts stand heat 4 times better

A typical example of B. F. Goodrich development in rubber

THIS endless pre-formed board of glass-fiber insulation for the Navy is moving out of the furnace at 300° F. It's a continuous operation, so a conveyor belt was needed to carry it away and let it cool. But the heat charred the cotton cords in every belt used—every few weeks the belt had to be removed, and that meant loss of production by shutting down this conveyor line. And in normal use the belts stretched, and had to be taken up every day.

Fiberglas and B. F. Goodrich engineers got together and worked out a belt using plies of glass fabric instead

of cotton. But oil had to be sprayed on the glass insulation, and this would ruin rubber. So B. F. Goodrich developed a synthetic cover that resists both the oil and the intense heat.

They made a wide belt of the new construction, then split it into narrow belts strong enough to carry the burden but leaving air spaces for quicker cooling.

The new belts have already lasted 6 months—4 times as long as the former belts—and look good for months more. And stretch has been practically eliminated—in the 6 months these new belts have had to be taken up only twice. Cost has been reduced, con-

tinuous production of vital material made possible.

This new belt construction in which B. F. Goodrich has practical experience can be of value in many postwar applications where heat is present and where low stretch is important. It illustrates why hundreds of users come to B. F. Goodrich first to have problems solved and to find improved products in all the industrial rubber goods they use. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.*

B.F. Goodrich
 RUBBER and SYNTHETIC products



"Bring on your TOUGH JOBS

Our equipment is wear-proofed
with
STOODY SELF-HARDENING now!"

WHEREVER you go—whatever the job, you've got to figure on equipment maintenance costs. Parts will wear out, equipment must go down for repairs. But there is a way you can lower both operating costs and downtime. Here's how:

Next time your power shovels are down for repairs, try Stody Self-Hardening on the bucket sides, bottoms, lips, runners and teeth; also on track pads, rollers, tumblers, idlers and other wearing surfaces. In the past these parts were often built up with high carbon or manganese rods. But here's the catch: Although these electrodes cost a few cents less than Stody Self-Hardening, all three require approximately equal application time, and equal shovel downtime—yet there's no comparison in wear resistance between Stody Self-Hardening and the others!

Differences in total cost between reclaiming shovels with any of the above three electrodes is negligible. However, Stody Self-Hardening will conservatively give double the wear of manganese deposits... several times the wear of high carbon. Stody Self-Hardening likewise bonds well with manganese parts, is easy to apply and won't chip under impact.

If you're looking for longer power shovel life with no extra trouble, order 100 lbs. of Stody

Self-Hardening today and give it a trial. Costs 50 cents per lb., f.o.b. 600 U. S. distributors or Whittier, California.

If you want to study typical photos and information on applying Stody Self-Hardening to all types of heavy equipment, write for our free booklet, "Specification Sheets." There is no obligation. **STOODY COMPANY, 1129 West Slauson Ave., Whittier, California.**

For building up worn areas before hard-facing with Stody Self-Hardening, specify the new Stody Manganese. You'll get greater speed of deposit, easier slag removal, low penetration with high build-up.

STOODY HARD-FACING ALLOYS

Retard Wear



Save Repair

*What makes this
Upson-Walton Oval Steel Block
a Better Block?*

Upson-Walton oval steel blocks for use with Manila rope are specifically engineered to give maximum service under actual operating conditions. Check these features that make Upson-Walton oval steel blocks *better* blocks!

STEEL SHELLS ARE ALL FLANGED to prevent the rope from chafing against the sides; lengthens operating life of the rope.

SHEAVES ARE MADE FROM CLOSE-GRAINED GREY IRON, hence they are stronger. Closely inspected to exclude all blow-holes, pits and other weakening inclusions.

SHEAVE RIM AND CENTER PIN ARE CONCENTRIC. Center pins are made of cold rolled steel. Unusual care is taken to insure true-running sheaves. Close tolerance between sheave bearing and center pin results in longer life for the bearing.

STURDY STEEL STRAPS are securely riveted to the shell assembly producing a more rigid block.

HEAVIER DROP-FORGED HOIST HOOKS . . . *not the usual and weaker round stock type, but specially-designed, heavy-duty hoist type as used on cranes and heavy equipment. Permits greatly increased safe working loads.*

AS WE GO TO PRESS, DELIVERIES
ON UPSON-WALTON OVAL STEEL
BLOCKS ARE GOOD



Established 1871

All Upson-Walton oval
steel blocks are furnished
complete with becket.



THE UPSON-WALTON COMPANY

Manufacturers of Wire Rope, Wire Rope Fittings, Tackle Blocks

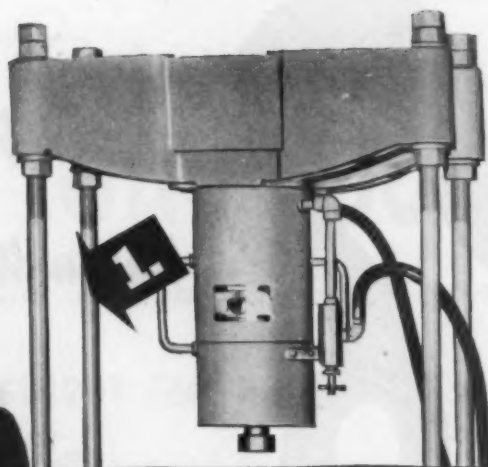
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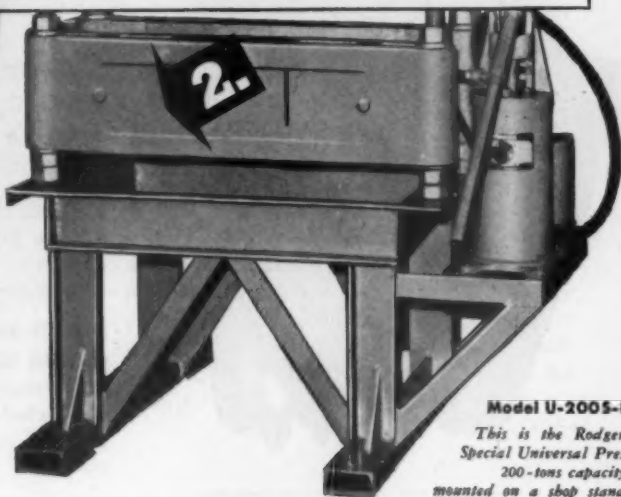
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**WHAT! 200 TONS
PRESSURE WITH THAT
PORTABLE PRESS?**



**SURE! STRONG AND
PORTABLE . . . THAT'S
THE RODGERS!**



Model U-2005-B

*This is the Rodgers
Special Universal Press
200-ton capacity,
mounted on a shop stand.*

THE RODGERS UNIVERSAL PRESS, like the airplane, is designed for heavy-duty operation, without being cumbersome. It's portable — saves time and labor because you can take it right to your pressing, pulling, or lifting job. 4 models — 50, 100, 150, 200 tons capacity. For complete information, write or wire Rodgers Hydraulic, Inc., 7451 Walker St., St. Louis Park, Minneapolis 16, Minn.

Uses for **RODGERS UNIVERSAL HYDRAULIC PRESS**

Pulling Gears, Sprockets, Pulleys, Couplings, Sheaves, Drums • Wheel Press Work
Jacking Pipe • Erecting Machinery • Relocating Machinery • All-Purpose Jack

1. For example, the frame rods are heat-treated alloy steel, 3 times as strong as ordinary steel rods of the same size.

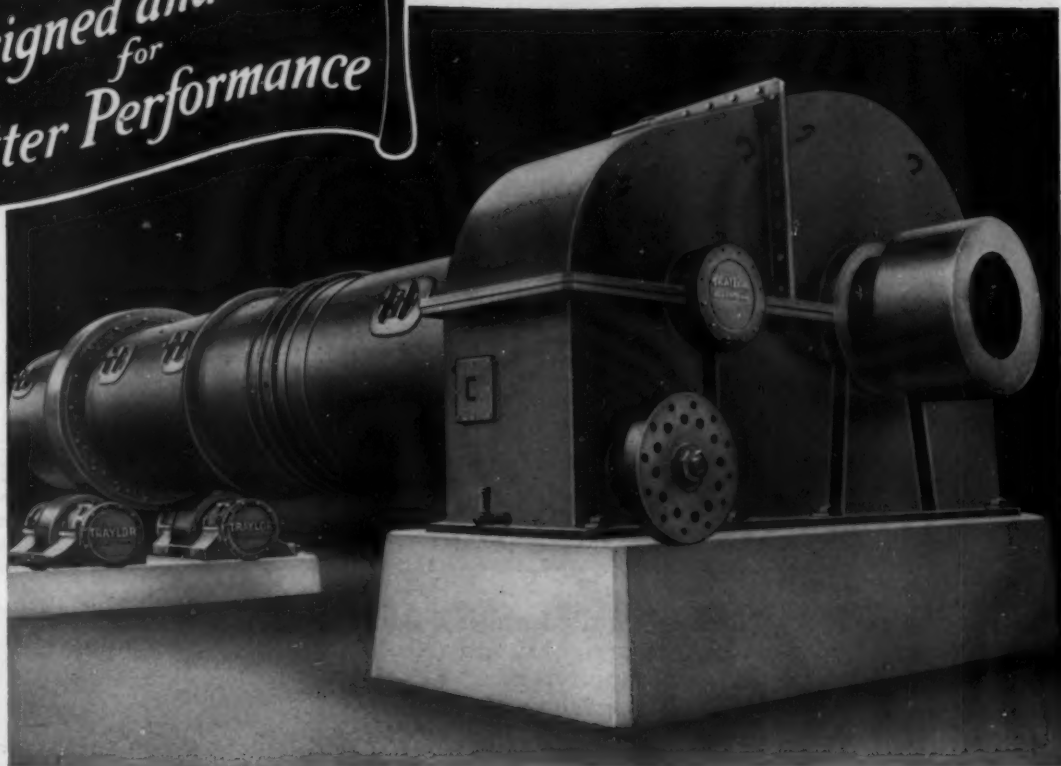
2. We also use heat-treated alloy steel for the frame head and base, which have the capacity of iron castings 4 times their weight.

RODGERS HYDRAULIC Inc.



If it's a Rodgers, It's the Best in Hydraulics

*Designed and Built
for
Better Performance*



WE BUILD

Rotary Kilns
Rotary Coolers
Rotary Dryers
Rotary Slakers
Scrubbers
Evaporators
Jaw Crushers
Gyratory Crushers
Reduction Crushers
Crushing Rolls
Grinding Mills
Ball Mills
Rod Mills
Tube Mills
Pug Mills
Wash Mills
Feeders
Rotary Screens
Elevators

Up-to-the-minute improvements—sturdy construction—steady production—lower upkeep—just a few features of Traylor Compartment Mills. Because of these and other features which enable these machines to give better performance they are preferred and purchased by leading cement, chemical and process plants everywhere.

Traylor Compartment Mills have always been up to the times—in design—in efficiency—in performance. The “know-how” of Traylor engineers, with years

of experience in equipment building enables them to meet and oftentimes anticipate the requirements of operators for grinding machinery that gives better performance yet keeps production costs down.

Write for Bulletin 2103



TRAYLOR

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18-inch sectional tire, for 11-2 inch diam. rotary kiln, partially assembled on floor of Vulcan erecting shop.

SECTIONAL TIRES FOR ROTARY KILNS

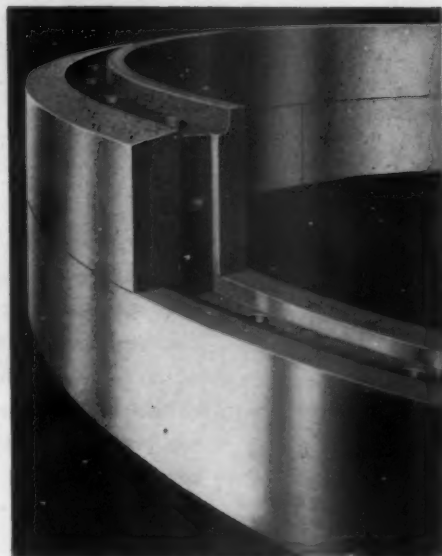
often afford

IMPORTANT SAVINGS

The one-piece cast-steel tires originally furnished with Vulcan rotary kilns, coolers, retorts, etc., are tough, hard and long-lived but, eventually, must be replaced. To replace a worn or broken tire with another one-piece tire is usually such a difficult and expensive undertaking, however, that most operating executives defer the job as long as possible. Sometimes too long—with disastrous results.

To meet this urgent need Vulcan engineers have developed several types of sectional tires—one of which, as here shown, is especially recommended for heavy-duty installations and guaranteed to give as good results as any one-piece tire of the same size. Many Vulcan sectional tires, of this and other types, have been installed during the past ten years and every one has given perfect satisfaction.

Naturally, Vulcan sectional tires cost more than solid tires of the same size but the saving in installation costs on most replacement jobs is so great that no operating executive can afford to overlook their ultimate economies. Vulcan engineers will be glad to recommend the best type of sectional tire for any given requirement and to help figure out the probable savings that can be achieved through its use.



Close-up of tongue-and-groove joints on Vulcan sectional tire shown above. Bolt-holes through the tire sections are reamed for 2" fitted bolts, with hex and jam nuts, and a dowel pin is used at each of the four end-joints.

VULCAN IRON WORKS

Established 1849

Main Office and Works **WILKES-BARRE, PA.,** New York Office 50 Church

Rotary Kilns, Coolers and Dryers	Toothed, Double-Roll Crushers	Heavy-Duty Electric Hoists	Steam Locomotives
Rotary Retorts, Calciners, Etc.	Heavy-Duty Briquetting Machines	Self-Contained Electric Hoists	Diesel and Gasoline Locomotives
Improved Vertical Lime Kilns	Ball, Rod and Tube Mills	Scraper-Loading Hoists	Diesel-Electric Locomotives
Automatic Quick-Lime Hydrators	Shaking-Chute and Chain Conveyors	Cast-Steel Sheaves and Gears	Electric Locomotives and Larrys

TOUGHEST THING ON WHEELS



BEST TIRE for bruising mine and quarry service is the time-proved Goodyear Hard Rock Lug — first choice wherever the going is toughest. And best proof of that is the fact that off-the-road as on highways, more tons are hauled on Goodyear truck tires than on any other kind! To reduce your tire troubles and expense, take a tip from this performance preference and equip with Hard Rock Lugs — standouts in stamina on rugged service operations.

BUY WAR BONDS ★ BUY FOR KEEPS

HERE ARE THE REASONS WHY:

MASSIVE LUG BARS armor the tread and sidewalls against cutting

SELF-CLEANING TREAD doesn't pack up, bites deeper, pulls better

EXTRA-THICK UNDERTREAD lengthens tire life—protects carcass from bruises

SUPERSTRONG CARCASS of Goodyear's patented Royotwist Cord—made from rayon—adds more stamina, long life

MULTIPLE BEADS of high tensile steel wire insure non-slip anchorage to rim

GOODYEAR

THE GREATEST NAME IN RUBBER

ROCK PRODUCTS, July, 1945

Royotwist—T. M. The Goodyear Tire & Rubber Company

New

KOEHRING

605

EXCAVATOR

ORDERS ACCEPTED
Now **FOR POSTWAR**
DELIVERY

Orders received now will still be placed
near the top of list that determines se-
quence of civilian deliveries.

KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN

New **KOEHRING 605**

POSTWAR 1½-YARD EXCAVATOR and 25-TON CRANE

Be among the first to earn greater profits with the new, designed-for-tomorrow 605, latest, but not the last, addition to the Koehring Postwar Line. New ideas in Heavy-Duty excavator design, tested and proven. Plus outstanding, exclusive advantages of earlier Koehring excavators. Greater operating ease. Higher production. More engineered-in strength. Order your Koehring 605 today to get earliest possible delivery.

KOEHRING COMPANY • MILWAUKEE 10, WISCONSIN

*Plan Now to
Own One*



HEAVY DUTY CONSTRUCTION EQUIPMENT

Only **ENTERPRISE** Vertical Mills give you all 8 benefits needed for modern production

- ✓ **HIGHER OUTPUT** ... Up to 4½ tons of asbestos rock per hour.
- ✓ **LESS OPERATING POWER** ... Only 40 HP at 1800 rpm required for this output.
- ✓ **LONGER LIFE** ... Hundreds of Enterprise Vertical Mills have been in use for years.
- ✓ **LESS MAINTENANCE** ... Durable materials used throughout, rigidly assembled.
- ✓ **FASTER SERVICING** ... Fewer working parts which are replaceable in minutes.
- ✓ **LESS WEIGHT AND SPACE** ... Only 40 inches square at base, 68 inches high, 3000 pounds.
- ✓ **QUIET, VIBRATIONLESS OPERATION** ... Vertical construction permits even load over entire rotor.
- ✓ **FLEXIBILITY** ... You can use any one of nine interchangeable rotor assemblies to meet conditions ... change screens to various degrees of fineness.



HERE IS PROOF!

The features of Enterprise Vertical Mills illustrated explain why Enterprise offers you these 8 benefits

Heavy duty motor, enclosed in moisture and dust proof compartments connected directly to shaft by flexible coupling eliminating power transmission losses.

Down feed, down discharge.

Trouble-free bearings, fully lubricated, enclosed in dust and moisture proof housings.

Material in disintegration chamber surrounds rotor so that the entire revolution of the rotor is engaged in useful work.

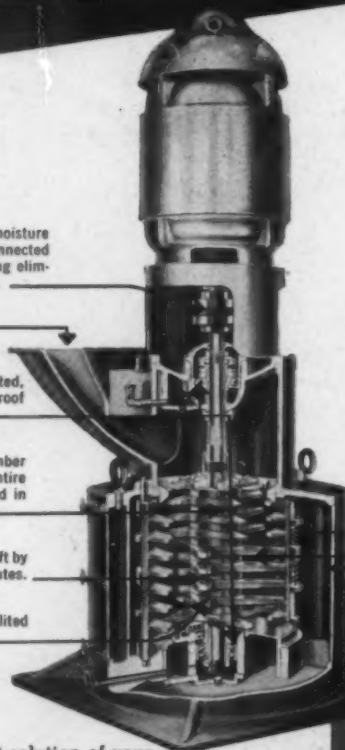
Hammers locked on solid steel shaft by locking rings are changed in minutes.

Leading edges of hammers stellite for longer life.

"Swing-away" comb rack prevents damage to mill if metal is accidentally fed into disintegrating chamber.

Entire screen area discharges finished material.

Simple construction with parts machined to fit. No crevices for materials to lodge.



For a simple low-cost solution of your problems of grinding, mixing, macerating, shredding or pulping, there is an Enterprise Vertical Mill to meet your needs. Write today for full information on models and applications. Address Dept. J-6.

PROCESS MACHINERY DIVISION

OF ENTERPRISE ENGINE
& FOUNDRY COMPANY

Mills - Presses

18th and Florida Sts.



Cookers - Dryers

San Francisco, Calif.

THE TRUCK WITH THE BATTLEFRONT BACKGROUND

● One of the battlefront jobs of the Ward LaFrance Heavy Wrecker, M1A1, is to move in under the very nose of the enemy and remove damaged tanks and other vehicles to a repair base where they can be put in fighting condition again. The M1A1 has performed amazing feats, under the worst possible operating conditions, on all major fronts, where human life depends on performance.

Building such good trucks is not new to Ward LaFrance, but our new commercial

models, inspired by the outstanding record of this 6x6 Ordnance vehicle, are by far the best trucks we have ever manufactured. Like the M1A1 they are big and tough with pay load capacity ranging up to 30 tons. They're the trucks with the "battlefront background"... designed, engineered, and manufactured for low-cost hauling. Now available to essential users. See your local Ward LaFrance dealer. If there is no dealer in your locality, write direct.



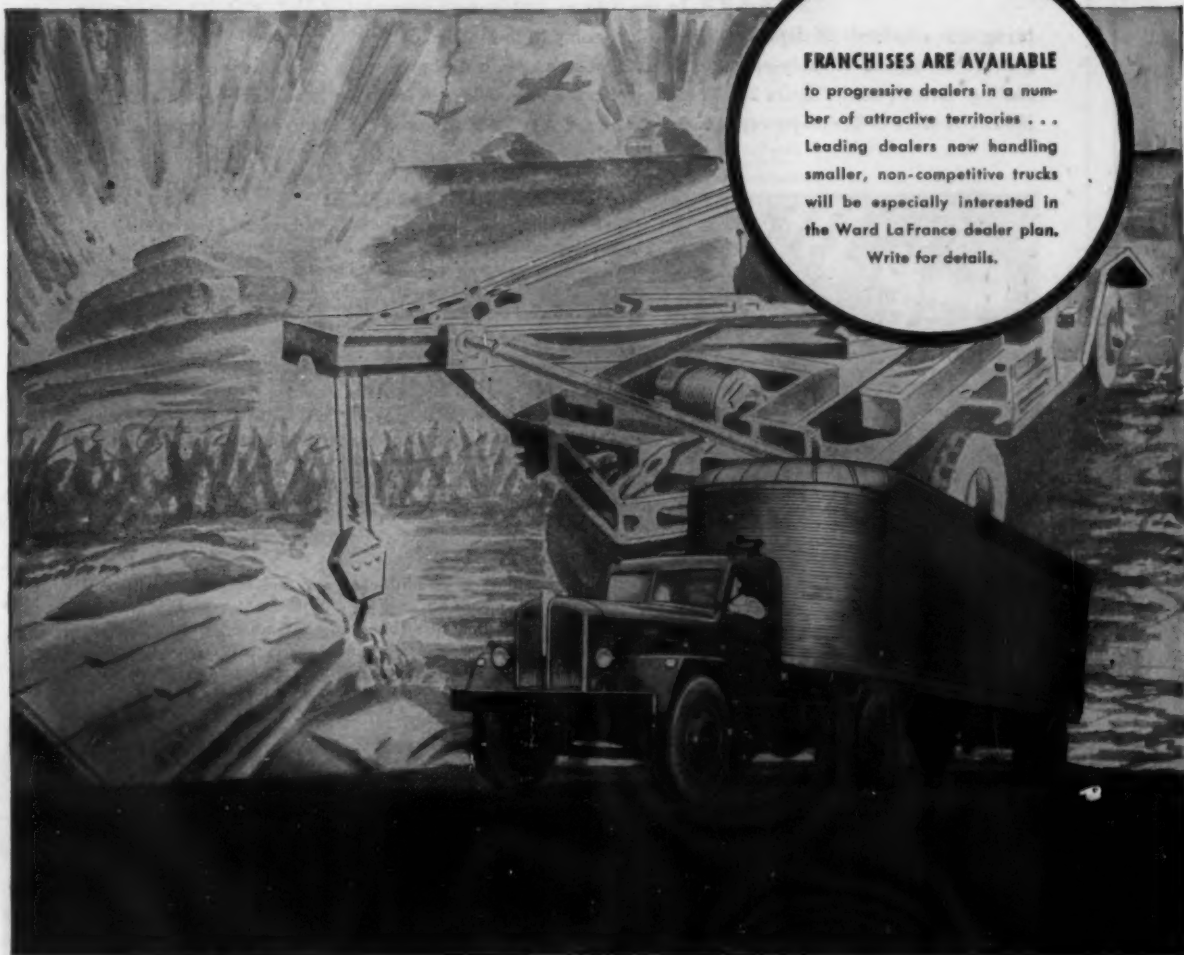
WARD LAFRANCE

TRUCK DIVISION

GREAT AMERICAN INDUSTRIES, INC. • ELMIRA, NEW YORK

FRANCHISES ARE AVAILABLE

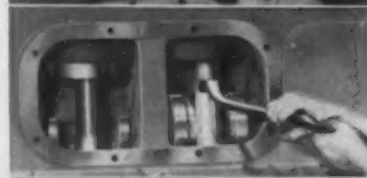
to progressive dealers in a number of attractive territories... Leading dealers now handling smaller, non-competitive trucks will be especially interested in the Ward LaFrance dealer plan. Write for details.



Announcing:

THE NEW SERIES 20 HENDY DIESEL

NOW in the 190 to 250 horsepower range—Hendy Series 20 Diesels bring new standards of dependability and economy to the industrial field. They are designed from the owner's viewpoint entirely—no concessions were made in design, use of old patterns, practices, or tooling. Consequently, Series 20 Diesels have features never before available in engines of this size. The industrial users of Diesel power can *now* obtain the very latest in tested Diesel-engine performance.



REDUCED MAINTENANCE:

Unit fuel pumps and injectors and the overhead camshaft eliminate all high-pressure fuel lines and many moving parts. Air-starting valves, intake and exhaust valves, and fuel injectors and pumps are actuated by rocker arms bearing directly on the overhead camshaft. Inspection and adjustments of valves and injection system can be made by removal of cylinder-head covers.

EFFICIENT OPERATION:

Full pressure lubrication to moving parts provides correct lubrication at all times. An integral oil-cooler keeps the oil at an efficient operating temperature. Uniform cylinder and head temperatures are assured by high velocity, controlled flow of the cooling water and the advanced design of the water jackets.

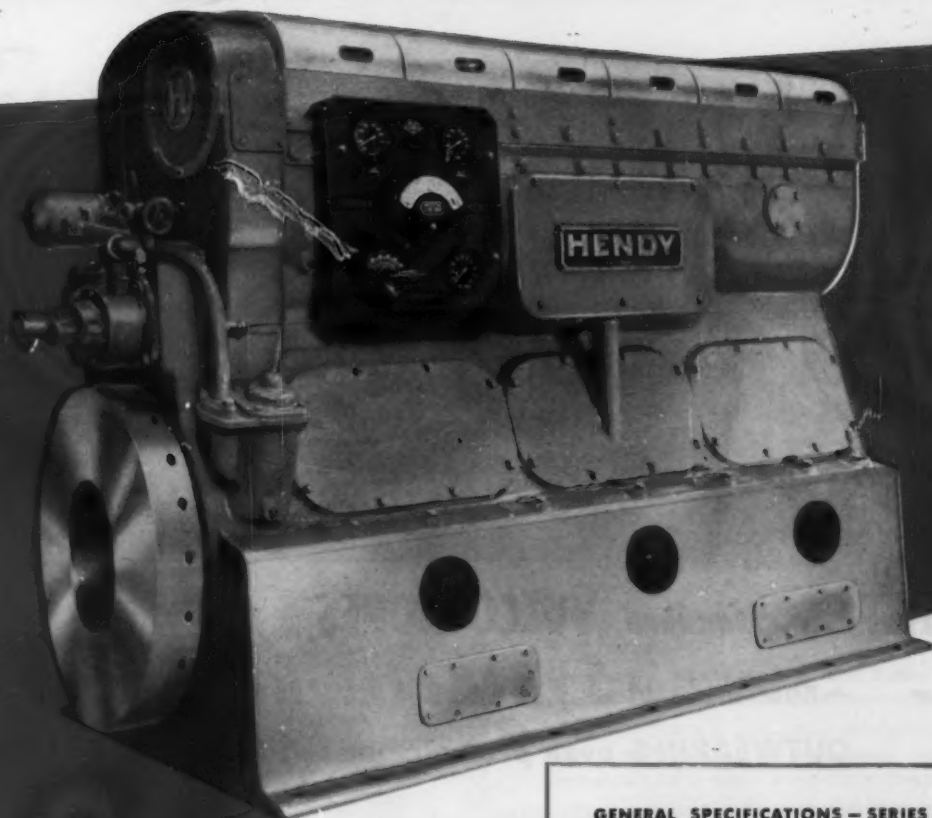
EASY SERVICING:

Fuel-oil filters, lube-oil conditioners, and fuel-transfer and lube-oil pumps are conveniently located for easy and quick servicing. Each can be removed without disturbing other assemblies. Unit fuel pumps and injectors can also be easily removed for inspection or service. Main and crankpin bearings are readily accessible by quickly removing the large hand-hole plates...without disturbing any other assembly.

LONGER LIFE:

The crankshaft is dynamically balanced, to minimize vibration at *all* speeds, and is large and well proportioned to assure long life and smooth operation. All bearing surfaces receive positive pressure lubrication. The crankshaft is supported by large, replaceable, bronze-backed bearings.





Diesel-power users will appreciate many important features in addition to those listed at the left. These new engines were designed specifically to meet the most rigid tests for economy and maximum dependability. And, what is equally important, they are built by skilled mechanics in plants unusually well equipped with modern, precision machine tools that take full advantage of production-line methods. Other Hendy Diesels available up to 800 horsepower. Joshua Hendy Iron Works, Sunnyvale, California.

GENERAL SPECIFICATIONS — SERIES 20

Bore 7 $\frac{1}{4}$ " ; Stroke 8 $\frac{1}{2}$ " ; 4-cycle; Air starting; 6-cylinder model (D-26) develops 190 hp, 8-cylinder model (D-28) develops 250 hp, both at 79 lbs. bmepl and at 900 rpm. Cylinder block fitted with wet-type replaceable liners; Cylinder heads individually cast; Exhaust manifold water-jacketed and cast in sections; Pistons, cast iron; Full pressure lubrication to moving parts, with oil cooled and filtered before entering distribution manifold. Optional equipment includes: closed-circuit cooling systems; clutch power take-offs from either end; belt-driven starting-air compressor. Also available as complete electric generating plants.

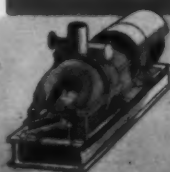


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WRITE TODAY for complete details. Just clip and mail the convenient coupon.



HENDY



REDUCTION GEARS TURBO-GENERATORS TURBINES

JOSHUA HENDY IRON WORKS
ESTABLISHED 1856
SUNNYVALE, CALIFORNIA

Please send me complete details on Hendy Series 20 Stationary Diesel engines ☐ Hendy Series 20 Diesel-generator sets ☐.

Name _____ Position _____

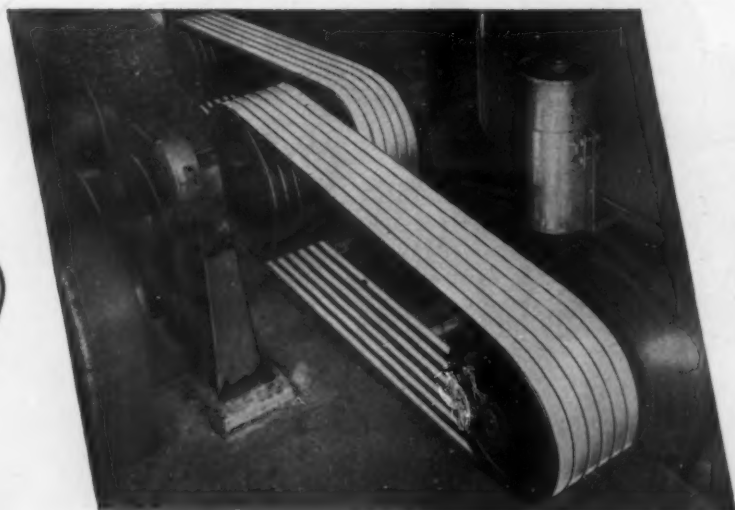
Company _____

Street _____

City _____ Zone _____ State _____

94-D-18

HERE IS A FACT
WORTH KNOWING



GATES *Standard* VULCO ROPES

—now made of ***Synthetic Rubber*** are
OUTWEARING even pre-war belts of **NATURAL RUBBER!**

NO ONE before the war had ever built a V-Belt that could stand the service now daily delivered by Gates V-Belts on army tanks, tractors and self-propelled big guns. Gates developed these greatly superior V-Belts through intensified, specialized research—and Gates is building these belts entirely of synthetic rubber.

✓ The importance of this fact to industrial V-Belt users is this:

Every improvement developed by Gates for these Army V-Belts has also been added, day by day, to the quality of the standard Gates Vulco Ropes which have been delivered to you.

It is only rarely, of course, that improvements developed primarily for army combat use can be passed on immediately to the general user—but there are very good reasons why Gates has not been called upon to withhold these important V-Belt improvements from industrial V-Belt users.

Efficient production in our nation's industrial plants is a prime essential to our winning of the war—and better V-Belts than ever before have been urgently needed to keep machines going on the forced-draft, war production schedules that have had to be maintained *24 hours a day!*

That is why Gates has been able to embody in the standard Gates Vulco Rope every V-Belt improvement which Gates specialized research has developed for use on the Army's motorized equipment—and that is why you are finding that your standard Gates synthetic-rubber Vulco Ropes are today giving you better service than any V-Belts that were built before the war.



THE MARK OF
SPECIALIZED RESEARCH

THE GATES RUBBER COMPANY

Engineering Offices and Jobber-Stocks in All Large Industrial Centers

487

GATES VULCO ROPE DRIVES

CHICAGO 6, ILL. 549 West Washington. NEW YORK CITY 3, 215-219 Fourth Avenue ATLANTA 3, GA., 738 C. & S. National Bank Bldg.
LOS ANGELES 21, CAL., 2240 E. Washington Blvd. DENVER 17, COLO., 999 S. Broadway DETROIT 4, MICH., 8663 Grand River Ave.
PORTLAND 9, ORE., 333 N.W. 5th Ave. DALLAS 2, TEXAS, 1710 N. Market St. SAN FRANCISCO 3, CAL. 1090 Bryant St.

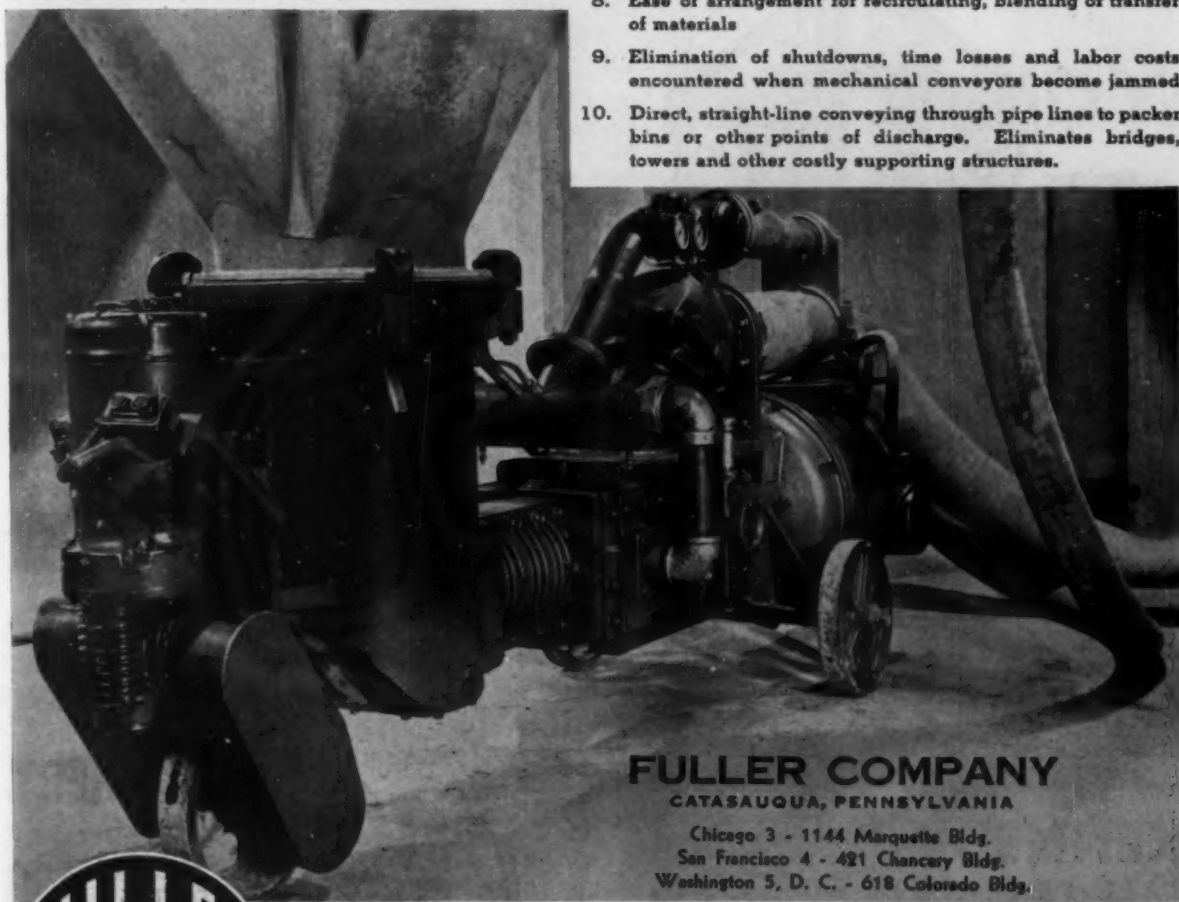
FULLER - KINYON

TRACKLESS PORTABLE PUMP

REPLACES OBSOLETE MECHANICAL CONVEYORS UNDER BINS AND SILOS

The latest adaptation of the Fuller-Kinyon Pump for conveying from bins and silos, has many advantages over mechanical conveyors, some of which are:

1. Low head room
2. No contamination
3. Dustless operation
4. Low installation cost
5. Low maintenance and operating cost
6. Can be moved under its own power, to any aisle or position, from one point of discharge to another
7. Connections quickly and easily made, without dust or loss of material, to outlet in bin or silo
8. Ease of arrangement for recirculating, blending or transfer of materials
9. Elimination of shutdowns, time losses and labor costs encountered when mechanical conveyors become jammed
10. Direct, straight-line conveying through pipe lines to packer bins or other points of discharge. Eliminates bridges, towers and other costly supporting structures.



FULLER COMPANY

CATASAUQUA, PENNSYLVANIA

Chicago 3 - 1144 Marquette Bldg.
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Washington 5, D. C. - 618 Colorado Bldg.



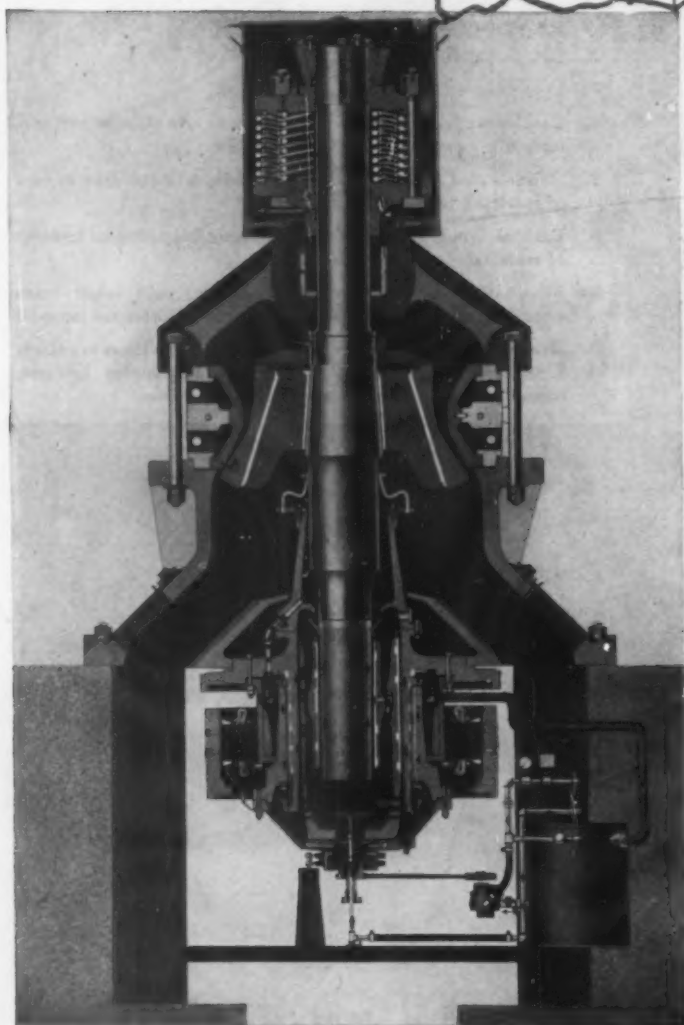
FULLER-KINYON, FULLER-FLUXO AND THE AIRVEYOR CONVEYING SYSTEMS
... ROTARY FEEDERS AND DISCHARGE GATES ... ROTARY AIR COMPRESSORS
AND VACUUM PUMPS ... AIR-QUENCHING INCLINED-GRATE COOLERS ... DRY
PULVERIZED-MATERIAL COOLER ... AERATION UNITS ... MATERIAL-LEVEL
INDICATORS ... MOTION SAFETY SWITCH ... SLURRY VALVES ... SAMPLERS

P-78

KVS Engineering

SAVES

80% in crusher maintenance costs
and 50% in crusher power costs



KENNEDY
BALL-BEARING
GEARLESS CRUSHER

To show what KVS Engineering means in the machinery you buy we point to one typical example—the Kennedy Ball Bearing Gearless Crusher. The synchronous motor driving this crusher is built right in the pulley assembly. In this way power is applied only for crushing; none is wasted in belts or gears.

This simple, direct and positive application of power has shown 80% savings in maintenance costs and 50% in power over geared crushers. It has produced 145 tons per hour when set to 7/16" between the head and concaves at the bottom. The motor runs on ball bearings and is continuously lubricated by a force feed lubrication system (shown in color in the illustration). The motor is built especially for this crusher.

Kennedy Ball Bearing Gearless Crushers are built in a wide variety of capacities—as standard type, short-shaft, and low head gyratory crushers. They give more uniform sizing, better crushing efficiency, at lowered manganese wear, greater capacity, and reduced power bills. Details of this type crusher are explained in Crusher Bulletin "M" which is available for the asking.

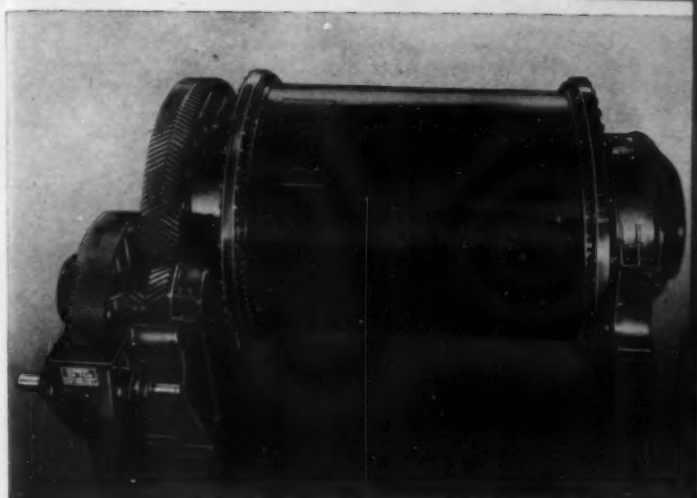
KVS

MACHINERY

KILNS
COOLERS
DRYERS
CRUSHERS
HAMMERMILLS

KENNEDY-VAN SAUN MFG. & ENG. CORPORATION

**FOR MORE EFFICIENT
PULVERIZING OF
COAL, CLINKER
AND RAW
MATERIAL**



The Kennedy Integral Gear-Driven Tube Mill represents the most advanced and versatile type of mill made. It is being used as rod mill and ball mill—for wet and dry grinding and for air sweeping.

Its design, an exclusive Kennedy patent, enables the motor to be directly connected to the high speed shaft by double reduction herringbone gears or noise-

less worm gear. The herringbone gear assembly shown here is carried on roller bearings, the seats of which are bored in a jig to a tolerance of $3/1000$ ". Gears cannot be misaligned or set wrong, and this greatly reduces power required to drive the mill. Other features include forced feed lubrication, sound absorbing elements, and electric eye mill level control.

KENNEDY INTEGRAL GEAR-DRIVEN TUBE MILLS

KENNEDY VIBRATING SCREENS

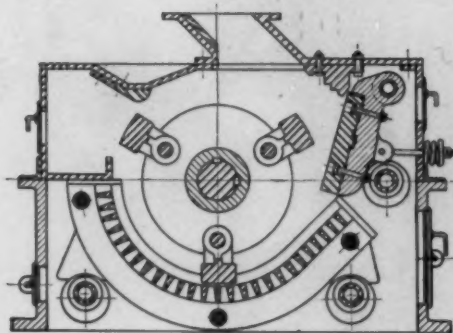
... already used in hundreds of plants, give positive action on the screen cloth without transmitting vibration to supporting members. They are made in a wide variety of sizes with single or double decks and to meet any screening requirements. The type of vibration used permits lower speeds for large pieces and higher speeds for small pieces. Material is continually turned over when passing along the screen surfaces. In this way, exceptionally high efficiency is obtained at all times. Standardize on Kennedy Screens.

**SCREENS
FEEDERS
CONVEYORS
ELEVATORS
GRINDING MILLS
CLASSIFIERS
WASHERS**

**DUST COLLECTORS
AIR SEPARATORS**

**Complete Cement, Rock
Crushing, Sand and Gravel,
Lime and Dolomite Plants.**

WRITE TODAY FOR
our catalog and description on these
and other types of KENNEDY ma-
chinery.



THE BEST HAMMERMILL FEATURES

are built into Kennedy Roll Hammer Crushers. The Type "E" machine which is diagrammed above is equipped with from three to eight hammers, depending on the material to be pulverized. This machine is easy to adjust while in operation by cam arrangements. The weight of the hammers depends largely upon the diameter of the machine and the material handled. Shafts are carried in ball bearings. Type "E" pulverizes from 75 to 500 tons per hour depending upon the size machine.

2 PARK AVENUE • NEW YORK 16, N. Y. FACTORY: DANVILLE, PA.



3

48

3-WAY ENGINEERING POINTED THE WAY TO 48-OZ. DUCK CONVEYOR BELTS

**FOR COAL
FOR ROCK
FOR ORE**

Many successful conveyor systems using 48-oz. duck belting developed by U.S. Rubber have been engineered for coal mines—both for underground and slope installations . . . also for handling rock and ore on big jobs involving long centers, high lifts, and heavy loads.

The success of these installations is due to closely coordinated planning on the part of the engineers representing mine operators, conveyor equipment manufacturers and United States Rubber Company . . . a "teamwork" policy you will find advantageous. When you plan a new conveyor system let our engineers work with you.

Listen to "Science Looks Forward"—new series of talks by the great scientists of America—on the Philharmonic Symphony Program, CBS network, Sunday afternoon, 3:00 to 4:30 P. M.

UNITED STATES RUBBER COMPANY

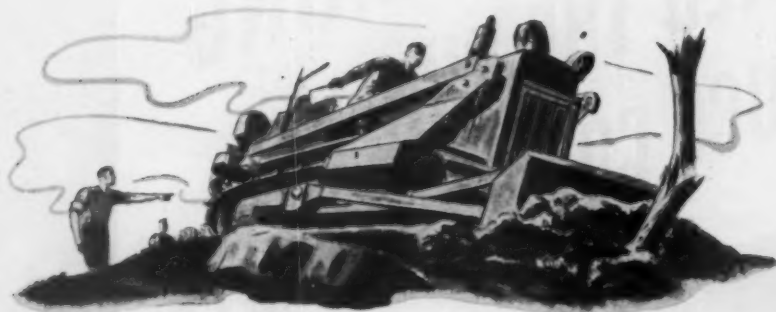
1230 Sixth Avenue, Rockefeller Center, New York 20, N. Y. • In Canada: Dominion Rubber Co., Ltd.

SERVING



THROUGH SCIENCE

Horse sense about Horsepower



Common, ordinary horse sense tells us that worn cylinders mean lost horsepower . . . and horsepower costs money.

To cut down this waste and keep engines up to top efficiency, we need something that will stand up to the beating that cylinder walls get. At least, that's what Hendrik van der Horst figured . . . and several years ago he discovered a cylinder wall surface that multiplies cylinder life 4 to 20 times.

Van der Horst discovered a method of bonding a thick layer of chromium to the cast iron of the cylinder bore and then giving it a "porosity treatment". Everybody knows that chromium resists corrosion and that it is almost as hard as diamonds. But the unusual feature of Van der Horst's PORUS-

KROME is the porous nature of its surface.

PORUS-KROME has thousands of tiny pores or channels in its surface . . . so tiny you can't see them with the naked eye. They act as reservoirs, holding lubricating oil and feeding it back to the surface as needed. Not only does PORUS-KROME make cylinder walls last longer, but it also multiplies the life of the conventional rings 3 to 5 times.

These are the reasons so many Army and Navy engines have PORUS-KROME in their cylinders. And it's just good horse sense to plan to have it in your engines, too. Write for booklet telling all about PORUS-KROME.

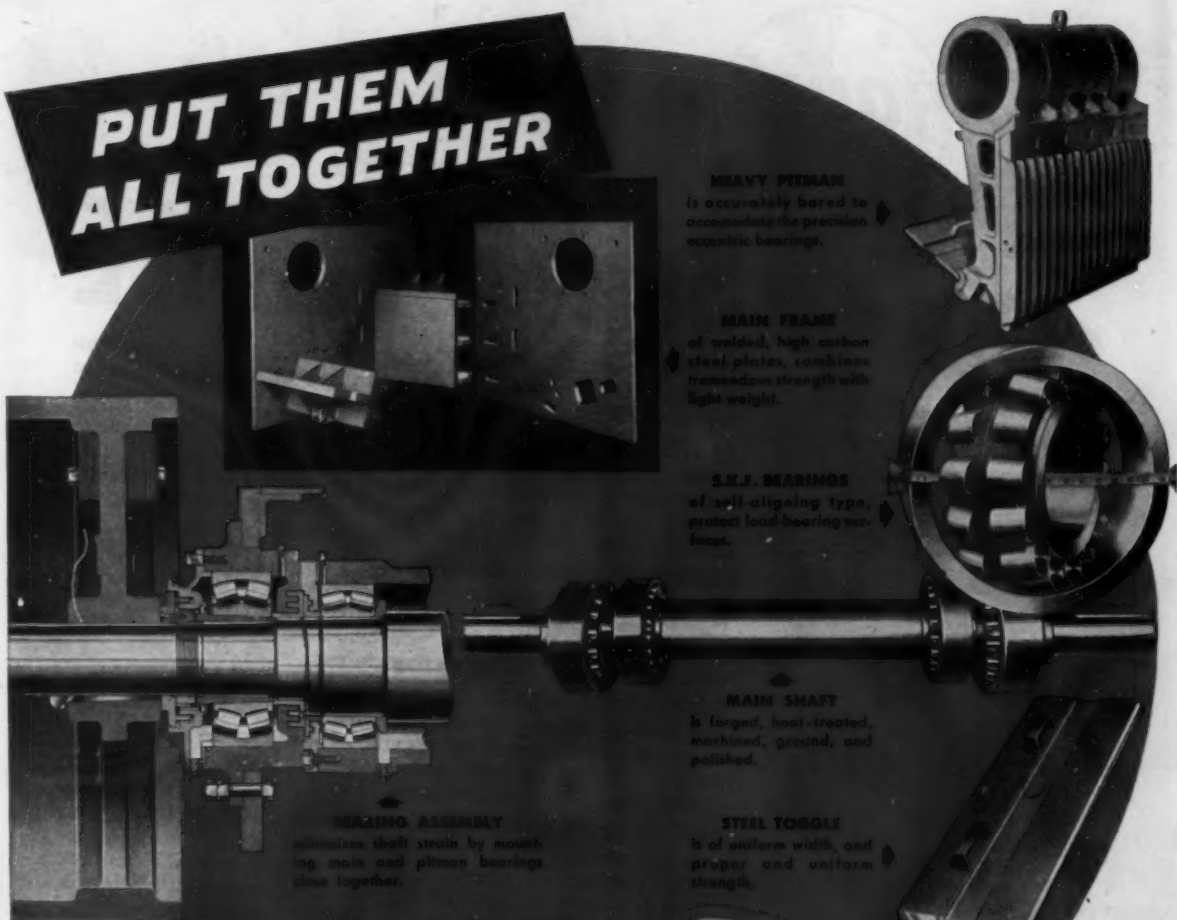
Van der Horst Corporation of America, Olean, New York. Plants in Olean, New York and Cleveland, Ohio.

PORUS - KROME

Good for the Life of your Engines

VAN DER HORST
TRADE MARK

**PUT THEM
ALL TOGETHER**

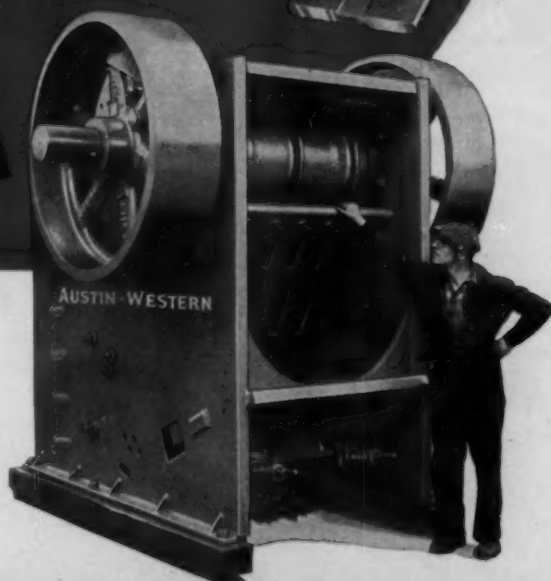


**AND YOU GET MAXIMUM ALL-
AROUND PERFORMANCE**

● Pictured on this page are but a few of the many exclusive features of design and construction which are responsible for the ability of *Austin-Western High-Speed Jaw Crushers* to exceed ordinary output standards by wide margins.

Bulletin 1960 tells the whole story. Your nearby A-W distributor will be glad to send you a copy.

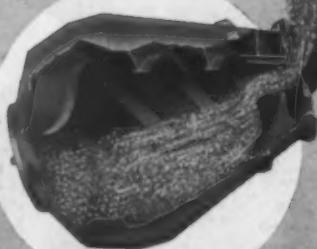
AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.



Austin Western
SINCE 1859

**BUY MORE
WAR BONDS**

Save **HOURS** on Every Concrete Job
with
SMITH-MOBILE



IN FASTER



OUT FASTER



**IN THE FORMS
FASTER**

Time is money! SMITH-MOBILE delivers more loads of uniformly mixed concrete per day than any other truck mixer on the market. Here's why —

FASTER CHARGING — Operator stays in cab. No hatch to open, clean and close again. Aggregates drop vertically into big, roomy feed chute and continue by gravity at high velocity toward opposite end of drum. No shafts or rods to clog up chute. Fastest loading cycle on the market.

FASTER MIXING — Drum rotates during charging operation. Shrinking and mixing start the instant a batch enters drum. This means faster and better mixing, also increased drum capacity. And while mixing, you can look into drum and SEE what's going on. No inspection delays.

FASTER DISCHARGE — Open sealing door as far as you wish, and reverse rotation of drum. Instantly the uniformly mixed concrete is discharged by gravity . . . as fast or slow as you want it . . . any quantity you desire. The speed of the drum controls the speed of discharge.

FASTER DISTRIBUTION — Smith-Mobile's high discharge permits steeper and longer distributing spout. Eliminates need for hoist or ramp, yet provides maximum radius of distribution. Even dry concrete can be poured directly into high forms, without pushing concrete down chute. More time saved!

Yes sir — SMITH-MOBILE is faster all the way. It will pay you to investigate. Write for Catalog No. 198-C.

THE T. L. SMITH COMPANY

2885 N. 32nd Street, Milwaukee 10, Wis., U. S. A.



The Original High Discharge
TRUCK MIXER and AGITATOR!

MARION HAS THE ANSWER!

What is Your Material Handling Problem?

The rock products' industry will benefit materially from the billions of dollars now being set aside for postwar developments.

To meet the demand that will exist for proven equipment, MARION has a machine of the right size and type from $\frac{3}{4}$

cubic yard to 35 cubic yards.

Put a fast, powerful MARION on that postwar job — then watch the rock and dirt fly!

Let's discuss your problems!



THE MARION STEAM SHOVEL CO. • MARION, OHIO
SHOVELS • DRAGLINES • CRANES • PULL-SHOVELS
CLAMSHELLS • WALKERS • *from $\frac{3}{4}$ cu. yd. to 35 cu. yds.*



This Symbol means:

**"Product of
INTERNATIONAL
HARVESTER"**



***It is the Mark of
EXPERIENCE and SERVICE***

INTERNATIONAL's full line of industrial power—TracTractors, Wheel Tractors, Power Units and Engines—is an important part of the large family of Harvester products.

This family is now identified with a new mark, the symbol displayed here. Let this symbol be your guide when you need the power International Harvester builds. It is a new mark for an old name, known to all the world—INTERNATIONAL HARVESTER. It is a symbol of what Harvester experience—years of engineering and manufacturing "know how"—can mean to you in getting your construction jobs done faster, better, at lower cost.

Now and postwar, depend on the sales and service facilities of the nationwide International Industrial Distributor organization.

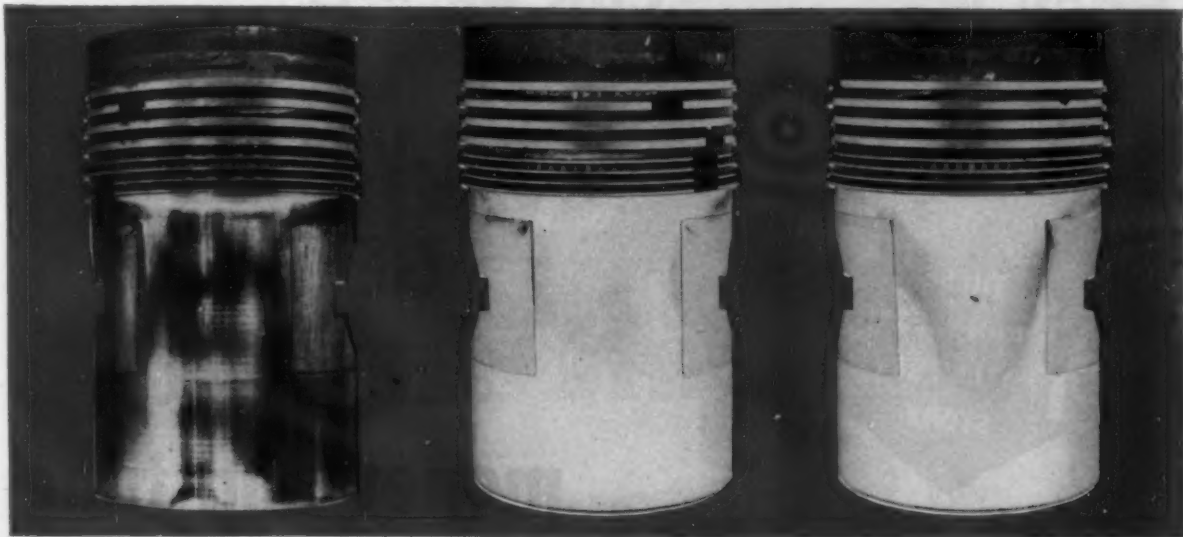
INTERNATIONAL HARVESTER COMPANY
180 N. Michigan Ave. Chicago 1, Illinois

INTERNATIONAL POWER on the job... the big TD-18 Diesel TracTractor, with bulldozer, on a mining operation in Nevada.

Power for Victory... Power for Peace

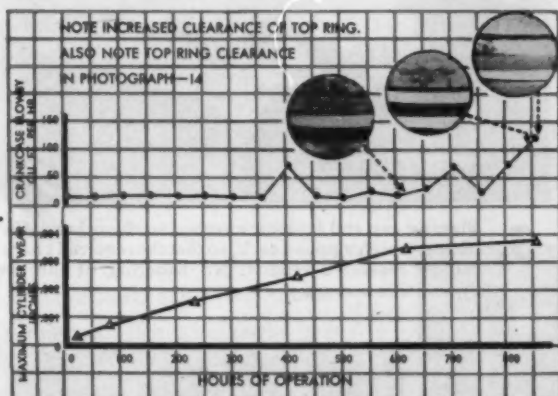
INTERNATIONAL HARVESTER

How RPM DELO OIL prevents ring sticking

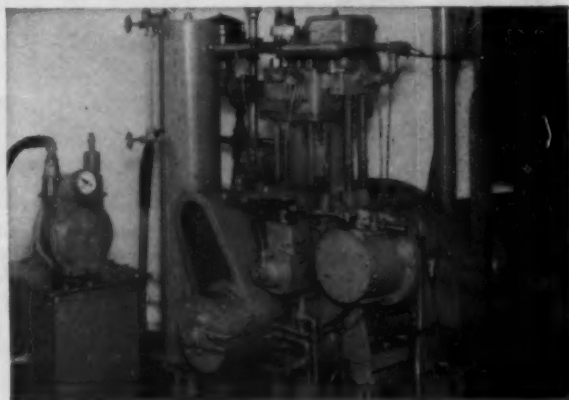


Even the finest uncompounded mineral oil will leave deposits on rings and skirts when operated under severe engine conditions. The above photo shows a test engine piston after 264 hours operation with the finest obtainable uncompounded Diesel engine oil.

Here's the same test made with RPM DELO Oil, only this time for 1000 hours—more than double the 480-hour test required in current military specifications. The photographs above show both thrust and anti-thrust sides of a piston after a 1000-hour test with RPM DELO Diesel Engine Lubricating Oil. Note that RPM DELO Oil has almost entirely prevented any deposits on skirts. Dark areas around rings are only soft carbon, not sticky varnish. The compounding in RPM DELO Oil makes this possible by preventing the initial formation of sticky varnish.



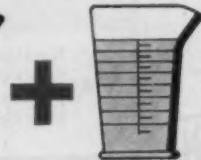
How blowby caused by cylinder and ring groove wear increases rapidly is shown by the above chart. Excessive side clearance caused by ring groove wear allows the ring to rock in its groove and "bite" into cylinder walls. RPM DELO Oil checks this wear at the start by an adhering agent which makes it cling to hot cylinder walls.



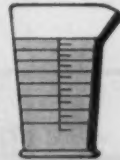
This single cylinder laboratory engine is used to measure the ring-sticking characteristics of Diesel lubricants. The test record of RPM DELO Oil has been confirmed by sales of millions of gallons since its development. For more technical information on RPM DELO Oil, write for Booklet T-7, Standard of California, San Francisco 20, California.



Detergent compound
to clean engine.



Anti-oxidant to prevent
gum and sludge.



Wear-reducing
compound.



STANDARD OF CALIFORNIA

RPM DELO Oil has world-wide distribution under the names: RPM DELO, Caltex RPM DELO, Kyso RPM DELO, Signal RPM DELO, Imperial RPM DELO, (CONCENTRATE)

Easy way to break up big ones...



HI-VELOCITY GELATIN saves labor, money and time

1. Du Pont research scores again by giving you a new method of secondary blasting. With Du Pont "Hi-Velocity" Gelatin dynamite it is not necessary either to remove the explosive from the wrapper or to confine the charge with mud.



2. A charge of Du Pont "Hi-Velocity" Gelatin is placed on the boulder above. Because this powerful dynamite always detonates at its highest velocity, less is required, saving from $\frac{1}{3}$ to $\frac{1}{2}$ the amount of explosives normally used for secondary blasting.

✓ CHECK THESE FEATURES OF "HI-VELOCITY" GELATIN:

1. **DEPENDABLE.** "Hi-Velocity" Gelatin always detonates at its top velocity.
2. **ECONOMICAL.** Saves labor ... reduces explosives cost.
3. **CONVENIENT.** Easy to handle ... easy to measure. Available in cartridges of $1\frac{3}{4}$ " x 8" weighing 1 lb., also 3" by 5 lbs.; 4" by 10 lbs.; 5" by 25 lbs.



3. Blasting cap and fuse are attached to the primer. Cartridges weigh a pound each, so that the required charge can be measured readily. No handling of the raw dynamite is necessary.



4. Result of the blast ... the strong, shattering action of "Hi-Velocity" Gelatin has broken the big boulder into pieces that can easily be moved. Labor, money and time have been saved.

Ask your Du Pont Explosives representative about this simple and economical method of secondary blasting. He'll be glad to give you full details. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.



DU PONT EXPLOSIVES

BLASTING SUPPLIES AND ACCESSORIES

It pays to be a Bemis Multiwall paper bag Customer

EVEN though direct government purchases have taken a considerable part of our multiwall paper bag production this year, Bemis customers have not suffered . . . they have been supplied on the basis of past purchases, even in the face of the labor shortage and no increase in facilities.

Naturally, the demand for Multiwalls has been greater than the supply. Much as we regret inability to fill all orders, we have felt a responsibility to take care of our regular customers first. Fortunately, we've been able to do that—and right on schedule. If it's humanly possible, we'll keep on maintaining this service.

War or peace, we want our customers to feel that it pays to be Bemis customers.



BEMIS BRO. BAG CO.

Baltimore • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver
Detroit • Houston • Indianapolis • Kansas City • Los Angeles • Louisville
Memphis • Minneapolis • New Orleans • New York City • Norfolk • Okla-
homa City • Omaha • St. Louis • Salina • Salt Lake City • Seattle • Wichita



A major reason we've been able to supply our Multiwall customers is the size and flexibility of our production facilities.

Bemis Multiwall Plants at

PEORIA, ILL.
EAST PEPPERELL, MASS.
MOBILE, ALA.
SAN FRANCISCO, CALIF.
WILMINGTON, CALIF.
ST. HELENS, ORE.

These plants not only give us large production, but also quick accessibility to all parts of the country.



East Pepperell, Mass.

HOW A



BUCKET LOADER

KEEPS YOUR TRUCKS

Rolling



● Cut down their idle time. Keep trucks moving in rapid rotation with a fast feeding Barber-Greene Bucket Loader.

There is no cheaper way to load bulk materials . . . no better way to hold labor costs down.

No time lost getting into position. With its crawler mounting, you can get over soft spots, maneuver in cramped corners easily.

Cutting action across the full width of the feeding spirals keeps the buckets full. Material is delivered at top capacity from stockpiles, natural deposits and during light excavating or soil stripping. You have twelve crowding speeds to cope with any loading condition.

There are a score of other advanced mechanical features in the B-G Bucket Loader that will help you save money on every material handling job. Write for free literature. Barber-Greene Company, Aurora, Illinois.

Ideal for stockpiling and reclaiming, this B-G Portable Conveyor handles large volumes with little horsepower and at minimum maintenance cost. It's one of the many types and sizes of B-G Standardized Permanent and Portable Conveyors.



Barber-Greene



Constant Flow Equipment



HOW LIMITAMP CONTROL PROTECTS YOUR MOTOR

1/2-CYCLE OPERATION clears
high-voltage fault currents before
they can do harm

LIMITAMP control, for use with squirrel-cage, synchronous, and wound-rotor motors, provides fast, positive short-circuit protection so necessary for safe operation at high voltages.

Your Motor Is Protected by These Three Limitamp Features

1. **1/2-cycle Operation**—By means of Type EJ-2 fuses, a rise in current due to a short-circuit is cut off in less than one-quarter cycle, and cleared in less than one-half cycle—long before fault currents can harm your motor.
2. **Efficient Overload Relays**—Accurately calibrated against actual motor characteristics, isothermic overload relays protect your motor from overheating due to sustained overloads, locked rotor, or single-phasing.
3. **Undervoltage Protection**—When there is a low voltage or when power fails, the control *takes the motor off the line*, and the motor will not restart on return of power.

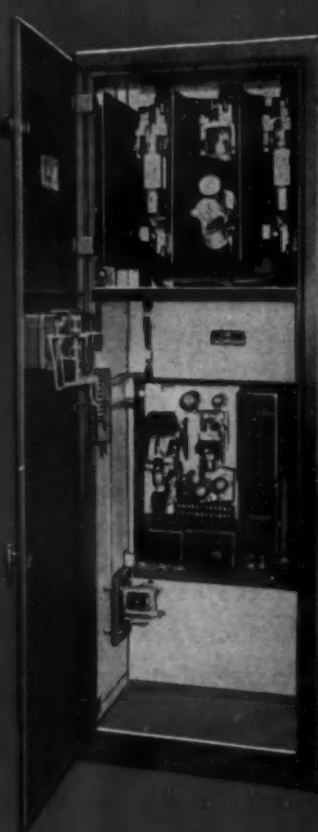
Noiseless in Operation—Limitamp control works silently. Operators are not startled by any part of its operation. Even when a fuse blows, there is no noise. There's only a plainly visible bulge in the end of the fuse.

A Co-ordinated Control

Air-break contactors, designed to meet the most severe requirements of high-voltage motor-control service, are co-ordinated with the EJ-2 fuses. Because the full short never passes through these contactors, it is possible for them to have a mechanical life of several million operations, and contact-tip life many times that of conventional devices. Bulletin GEA-4247 gives a well-illustrated description of all the features that make Limitamp control tops in the field of high-voltage control. Ask our local office for a copy, or send the coupon direct to General Electric Company, Schenectady 5, N. Y.

Buy all the BONDS you can—and keep all you buy

GENERAL  ELECTRIC



On voltages up to 4200 volts, the interrupting capacity of Limitamp control makes it the logical answer for any application where high-voltage fault currents are encountered.

General Electric, Section 676-163
Schenectady 5, N. Y.

I'd like more information about your Limitamp control. Please send me Bulletin GEA-4247.

Name.....

Company.....

Address.....

ANOTHER REASON WHY

Bethlehem Form-Set LASTS

Let's say that after a long period of service there's a broken wire in your Bethlehem Form-Set (preformed) rope. What happens? Well, the answer is . . . very little happens. Even though the wire has broken clear through, it still lies flat in its original position. It doesn't spring up; it doesn't pop loose from the strand. That's because the rope has been preformed . . . relieved of the tension that makes wires try to straighten out.

How does this affect the remaining life of your rope? It affects it very vitally. Since the wire still lies smoothly in place, the broken ends do not lap over the other wires. Thus no lump is formed; the broken wire does not crush, grind, or dig into its neighbors as the rope travels rapidly on sheaves and drums.

When an outer wire breaks in a rope of 6 x 19 construction, the total strength is re-

duced about six-tenths of one per cent. This in itself is not serious. But the strength is reduced another six-tenths of one per cent for each additional broken wire. That's why it's so important to avoid the nicking effects of overlap—a condition that encourages failure in other wires.

You can eliminate this type of progressive wire breakage by rigging your machines with Bethlehem Form-Set. Moreover, when you use Form-Set, you have a rope that is supple, easy to handle, and highly resistant to bending fatigue. All of these factors mean longer wire-rope life—which, in turn, means overall savings.

When you think WIRE ROPE

. . . think BETHLEHEM



BUILD BETTER *Airports*

Use a CEDARAPIDS Model "E" ASPHALT PLANT



Courtesy of TWA



Built by
IOWA

THE IOWA LINE

of Material Handling Equipment Includes

- | | |
|--------------------------------------|-----------------------------|
| ROCK AND GRAVEL CRUSHERS | REDUCTION CRUSHERS |
| BELT CONVEYORS | BATCH TYPE ASPHALT PLANTS |
| STEEL BINS | TRAVELING (ROAD MIX) PLANTS |
| BUCKET ELEVATORS | DRAG SCRAPER TANKS |
| VIBRATOR AND REVOLVING SCREENS | WASHING PLANTS |
| STRAIGHT LINE ROCK AND GRAVEL PLANTS | TRACTOR-CRUSHER PLANTS |
| FEEDERS—TRAPS | STEEL TRUCKS AND TRAILERS |
| PORTABLE POWER CONVEYORS | KUBIT IMPACT BREAKERS |
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The three thousand new airports to be built after the war must be smooth, permanent, dustless, all-weather, have tremendous load-carrying capacity and be economical to build and maintain. All these features can be had by building runways, taxi strips, aprons, service roads and hangar floors with asphalt. Here's the opportunity for real profits for contractors with Cedarapids asphalt plants. The Cedarapids line of bituminous mixing plants is the most diversified and complete offered by any manufacturer. Take the Model "E" for example, which will enable you to bid successfully on any bituminous job that comes along. Power consumption is low. Grading and proportioning are accurate beyond the tolerances of the most rigid specifications. Its 3000 or 4000-lb. capacity is large enough to handle the largest jobs. The "E" can be set up as a permanent installation or used as a portable plant. Erecting, knocking-down and transporting are exceptionally easy for a plant of this size. Everything has been included that contributes to money-making production. Remember Iowa is also headquarters for aggregate producing equipment too. See your local Iowa dealer for full information.



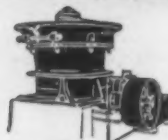
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Cedar Rapids, Iowa





Where will
YOUR plant
fit in the
postwar
picture?



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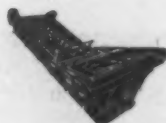
GYRASPHERE SECONDARY CRUSHERS



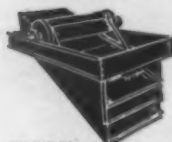
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Start your modernization plans now. Get ready for quick reconversion. Build in new plant efficiency with Telsmith Equipment.

By replacing worn out, obsolete or inadequate units with the right Telsmith machinery you can eliminate roundabout methods of

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Telsmith expert engineering help is at your disposal, whether you plan to expand, modernize or build a complete new sand and gravel or rock crushing plant. Consultation involves no obligation. Get Bulletin E-11.

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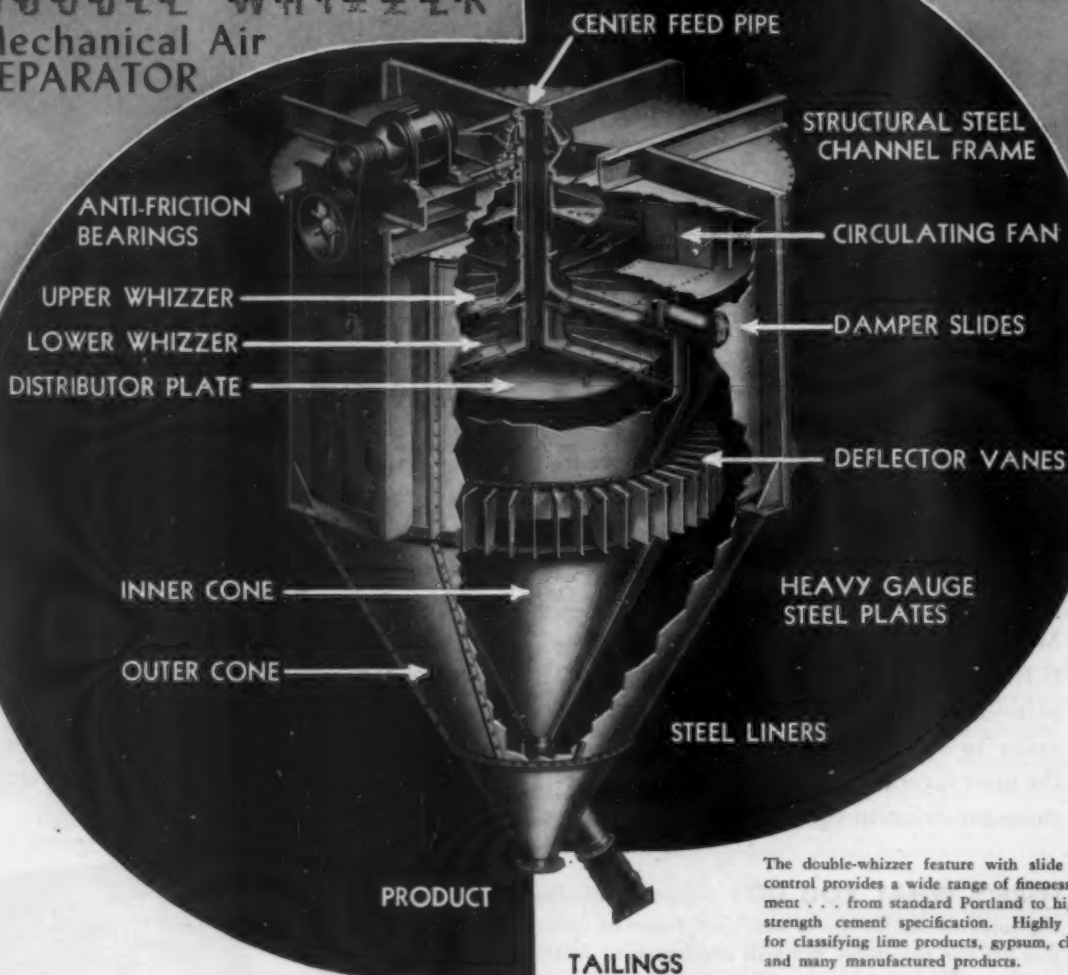
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Mechanical Air
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Built in nine sizes from 2'6" to 18'0" diameter . . . also a Laboratory Separator for classifying test samples.

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It has proved to be an ideal unit for closed circuit grinding operations . . . increasing capacities from as low as 25% up to several hundred per cent, according to the material handled.

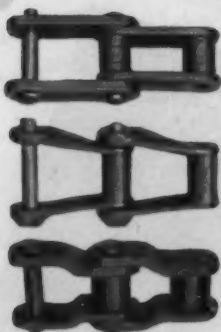
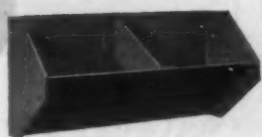
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Bulletin No. 56

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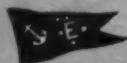


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Long years of research are behind each individual part that goes into Jeffrey equipment.

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ESTABLISHED
1877



Operators Don't Have to Fight



A Buckeye!



Send for a copy of "The Age of the Clippers." Learn about the man-saving features of Buckeye Clippers and their 24 points of superior design and construction for your post war operations.

Operators don't have to wear themselves out fighting your shovel if it's a Buckeye Clipper — because Buckeyes have "Mevac" Metered Vacuum Control.

Note the streamlined instrument panel and simplified "Mevac" operating levers in the cab of the Buckeye Clipper. "Mevac" Metered Vacuum Control (similar to that used for years on big highway trucks) makes shovel operation faster and easier. The operator moves the handles—the vacuum does the work. The result is a bigger day's work with less operator fatigue.

Buckeye Clippers are made in $\frac{1}{2}$ and $\frac{3}{4}$ yard capacities and can quickly be converted to trench hoe, crane or dragline. Features include automatic swing brake; patented non-clogging, self-cleaning crawlers; automotive type power transmission and other design features that make for faster, easier operation, longer life and minimum maintenance.



Quickly convertible from shovel to trench hoe or dragline.



Built by Buckeye

Buckeye Traction Ditcher Co., Findlay, Ohio



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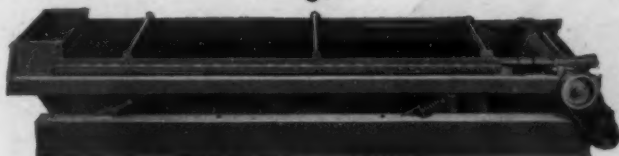


Spreaders

Wherever Screening is Done

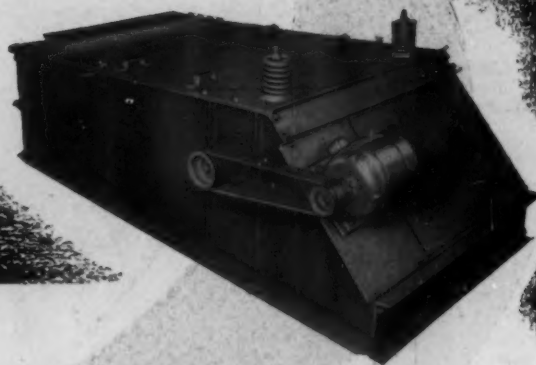
One of these four types of Symons Screens will meet your requirements for screening of ores, coal, aggregates, minerals, chemicals, etc.

Write for descriptive bulletins



HORIZONTAL SCREEN

Recommended where extreme accuracy of sizing is essential. Easily installed in existing plants because of minimum headroom required



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Applicable for handling gummy, sticky ores and materials difficult to screen. Screening surface consists of spring steel rods which permit of big capacity and being individually replaceable assures long life and low maintenance cost.

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For fine wet screening of mine pulps, sand, chemicals, oil well mud and similar materials. Unusual screening action provides efficient separation with comparatively dry discharge.



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For heavy duty scalping service for openings larger than 2½ inches. The intensive vibrating action is particularly effective on feeds that are sticky and gummy.

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SYMONS SCREENS

Now LAY-SET PREFORMED
I.P.S.* *is* **ALL GREEN!**



● The new GREEN LUBE, made to Hazard's own specifications, clings to the wires better, thereby affording increased protection. Wires wear longer; the entire rope gives longer service. That is why every strand in LAY-SET Preformed I. P. S. is packed to the point where every void is completely filled with this superior lubricant.

Here is the ultimate in wire rope perfection.
... Hazard LAY-SET Preformed made of Improved Plow Steel*
... every strand of which is literally stuffed with our superior green lubricant ... the best of all rope made still better by the more adhesive green lubricant which coats every wire.

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In Business for Your Safety

ROCK PRODUCTS

War Experiences Can Benefit Industry

THE UNPRECEDENTED PRODUCTION CHALLENGE that confronted the rock products industry for war construction, which was terminated so successfully, and the maze of Government regulations and edicts that followed in its wake will not soon be forgotten. Some of the experiences, educational ones, most certainly should long be remembered, for they can be put to profitable good. New knowledge about men and machinery and plants has come out of this war that may be applied in a practical way to systems of doing business after the war.

Management has been overly-exposed to the whims of labor and, sadly enough, has too often had the same kind of experience the housewife so often is having with the butcher. The true nature of individuals comes out when conditions are all in their favor, however temporarily. As a result, management has had to contend with inefficiency, instability and shortsightedness on the part of many mistrusting and misguided employees, that have inflated production costs simultaneously with the imposition of price ceilings.

When the National War Labor Board established controls over workers, and their wages and salaries, strained labor-management relations were one result. Such relationships are a luxury that this industry, among others, cannot afford and it will not be its desire to perpetuate the existing highly unsatisfactory system of having government tribunals resolve problems that are essentially local.

Speaking idealistically, labor problems should be solved in a family spirit and it certainly would be desirable, given loyal and capable workers, to keep them posted with facts about the business and to do everything practicable to build an atmosphere of mutual trust.

Better Working Conditions

The industry as a whole has learned to appreciate its loyal employees, as indispensable to profitable operation, and should endeavor to find new ways to do something extra for them that will also stimulate a new generation of workers equally as loyal. These men appreciate and are entitled to good, clean working conditions, the convenience of showers, locker rooms and the like, whenever practicable to provide such facilities. Some large plants in the industry have made a start in that direction; we merely wish to re-emphasize a genuine need here.

Along with changing the attitude of labor toward management is the corollary of employing better plant equipment and methods, since any business must make profits, one way or another, in a free enterprise system. Certainly, operating a plant under price ceilings concurrent with steadily rising costs has focused close

attention upon wasteful production practices—practices which will be just as wasteful after the war. Some of the post-war plant construction plans that have come to our attention anticipate tightening up on production costs all around, which is a hopeful sign.

The small margin between price and cost, drawing closer together progressively for many producers, will serve one good purpose, if it will lead to concentration toward the elimination of those obvious little operating details that eat up profits. There are big ones too. One of our larger producers of crushed stone, a very well-managed concern at that, admits to a nine percent loss in time at a primary crusher due to stone bridging alone. At a 200-ton per hour rated capacity, that is quite a loss, but one that is not fully appreciated by many. Post-war plant designs should anticipate correlation of equipment to minimize such losses.

Accurate cost accounting systems will go a long way toward the elimination of excess costs of production. The industry is notoriously lacking in good cost accounting procedure but it is a cinch it has had to learn something about bookkeeping during the war. Adaptation of facilities and good clerical help now on hand to the more refined art of keeping detailed production cost records might be a wise investment.

Maintenance Significant

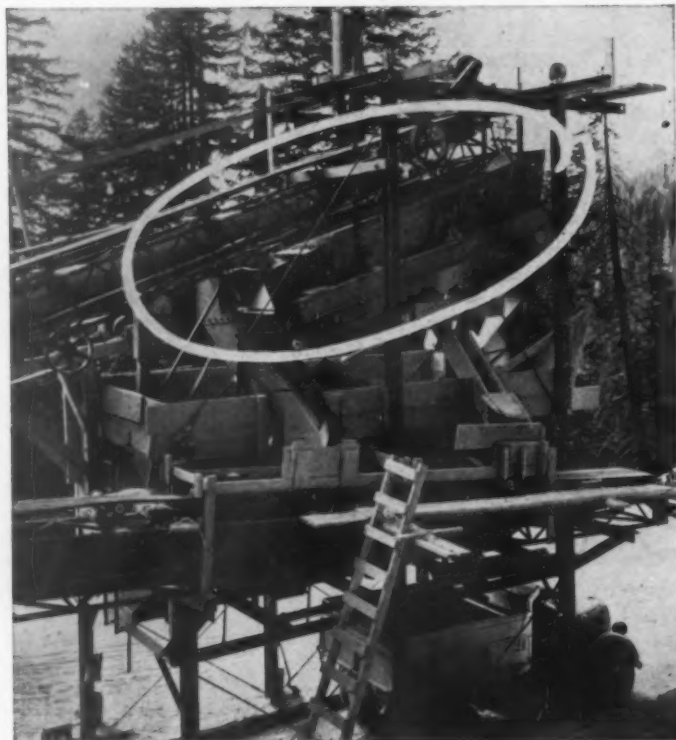
The war afforded a unique opportunity for producers to learn something about the limitations and life of machinery and equipment, and the comparative performance of types of equipment under conditions of stress and strain that defy duplication. It taught how to prolong the useful life of equipment and certainly will contribute data on equipment failures that should be invaluable and which should be made available to manufacturers of machinery for the future benefit of the industry. Literally, a life test was conducted.

Producers will have more respect for maintenance of plant, from their experiences, after having been forced through lack of labor to forego repairs. In the portland cement industry, long deferred routine jobs like the repair of cracked kiln tires have already cost the industry thousands of dollars in the replacement, section by section, of warped, distorted kiln shells.

Finally, the war has seen the development of new control instruments, and devices, new metals and supplies, and has demonstrated applications of machinery and equipment that will serve the rock products industry well when the world is at peace.

Bror Nordberg

Screen **MORE** Tonnages Per Day



Outstanding individual features are why user after user says Simplicity Gyrating Screens make cleaner separations to closer tolerances with very little upkeep.

Standard features include a counterbalanced eccentric shaft; rubber-mounted screen corners, screens in four-way tension over doubly crowned surface, dust sealed Alemite lubricated roller bearings; extra rugged construction; and rubber cushioned power.

You should study these and other features in detail. Write today for a copy of Bulletin No. 37.

Four-way tension on screens.

Double crowned surface.

Extra sturdy, all-steel construction.

Dust-sealed Alemite lubricated roller bearings.

Counterbalanced eccentric shaft.

Opposed rubber corner supports.

Simplicity

GYRATING SCREENS

Simplicity

TRADE MARK REGISTERED

ENGINEERING COMPANY

DURAND, MICHIGAN

Basically the most important thing about any vibrating screen is, "How much material will it handle in a given time?" And here as in other respects Simplicity Gyrating Screens give the outstanding performance.

Take the 4' x 12' Triple Deck Simplicity Gyrating Screen shown in the temporary plant installation at the left. It is handling 2000 tons per day of 18" and under rock. Another user reported an increase in 50% in plant capacity merely by replacing its screening unit with a Simplicity of the same size.

Nor are these isolated cases. Results like that can be shown for hundreds of installations in all types of plants, small and large alike. Such results are why you should investigate Simplicity before making your next screen installation.

★ ★ ★ Washington NEWS

CONTROLS over manpower and materials are gradually being eased by the War Manpower Commission and the War Production Board, but in certain areas where there is a tight labor situation due to heavy war contracts the changes will not be effective. Reflecting the changed situation since V-E Day, is the new procedure announced by War Manpower Commission Chairman Paul McNutt. The new procedure permits area W.M.C. officials, in consultation with Area Management-Labor Committees, to move to retain, modify, or reapply any or all manpower controls in an area or plant as labor conditions warrant. Before such action can be put into effect, however, it must have the approval of the regional director who will be guided in his decision by national standards. Thus, local, or Area Management-Labor Committees are assured full participation with area directors in decisions that have to be made in modifying the manpower program in accordance with changing labor market conditions in the specific area.

Supreme Court Passes on O.P.A. Ruling

In the case of Chester Bowles, Administrator, O.P.A. vs. Seminole Rock and Sand Co., the United States Supreme Court has upheld O.P.A. in its contention that the company was bound by the highest price for its materials actually delivered in March, 1942, although it was admitted that the company quoted a substantially higher price in that same month for the same material for delivery later in the year. A Federal District Court and the Circuit Court of Appeals had upheld the argument of the Seminole Rock and Sand Co., that its "highest price charged in March, 1942" was a contract price of \$1.50 per ton for delivery later in the year. O.P.A. contended that the ceiling price of the company was 60c a ton, because that was the price at which the crushed stone was actually delivered in March, 1942, to a railroad company, pursuant to an agreement between the company and the railroad effected in October, 1941. The Supreme Court reversed the lower courts and supported O.P.A. in its claim that its regulations were controlling. In its opinion, the U. S. Supreme Court quoted Section 1499.153 (a) of MPR No. 188 as follows:

"Highest charged during March, 1942" means:

"(i) The highest price which the seller

charged to a purchaser of the same class for delivery of the article or material during March, 1942; or

"(ii) If the seller made no such delivery during March, 1942, such seller's highest offering price to a purchaser of the same class for delivery of the article or material during that month; or

"(iii) If the seller made no such delivery and had no such offering price to a purchaser of the same class during March, 1942, the highest price charged by the seller during March, 1942, to a purchaser of a different class, adjusted to reflect the seller's customary differential between the two classes of purchasers; ..."

Conditions under which this important decision was made are quoted from the opinion. "In October, 1941, respondent (Seminole Rock & Sand Co.) contracted to furnish the Seaboard Air Line Railway crushed stone on demand at 60c per ton, to be delivered when called for by Seaboard. This stone was actually delivered to Seaboard in March, 1942. In January, 1942, respondent had contracted to sell crushed stone to V. P. Loftis Co., a government contractor engaged in the construction of a government dam, for \$1.50 a ton. (Contract was in terms of \$1.50 per cu. yd., but opinion stated that there is no appreciable difference between a cubic yard of crushed stone and a ton.) This stone was to be delivered by respondent by barge when needed at the dam site. A small portion of stone of a different grade than that sold to Seaboard was delivered to Loftis Co. during January pursuant to this contract. For some time thereafter, however, Loftis Co. was unable to pour concrete or to store crushed stone at the dam site. Respondent thus made no further deliveries under this contract until August, 1942, at which time stone of the same grade as received by Seaboard was delivered to Loftis Co. at the \$1.50 rate. Subsequently, and after the effective date of MPR No. 188, respondent made new contracts to sell crushed stone to Seaboard at 85c and \$1.00 per ton. Alleging that the highest price at which respondent could lawfully sell crushed stone of the kind sold to Seaboard was 60c a ton, since that was asserted to be the highest price charged by respondent during the crucial month of March, 1942, the Administrator of the Office of Price Administration brought this action to enjoin respondent from violating the Act and MPR No. 188."

Seniority for Veterans

Executive Secretary V. P. Ahearn of the National Sand and Gravel Association recently sent out a bulletin

which gives the opinion of the Director of Selective Service that Section 8 of the Selective Training and Service Act of 1940, as amended, means that a returning veteran, who meets all of the reemployment conditions of eligibility required by the statute, has an absolute right to be restored to his former position or a position of like seniority, status, and pay. Labor unions in some cases have interpreted the law to entitle the veteran to restoration of his job rights in accordance with the seniority system of the employer. However, this is contrary to the opinion of the Director of Selective Service. The only conditions in the Act controlling reemployment are as follows: (a) That the veteran receive a certificate of satisfactory service; (b) that he still be qualified to perform the duties of his position; (c) that he make timely application (within 90 days after discharge) for reemployment; (d) that the restoration be not unreasonable or impossible because of the employer's changed circumstances.

Revise L-41 Order

War Production Board conservation order L-41 was amended May 29, to permit certain types of construction with a larger valuation. It is now unnecessary to get WPB permission for the following construction jobs if the cost does not exceed the following amounts in any calendar year:

(1) \$1000 for a house designed for occupancy by one family (including a farm house, i.e., a building on a farm used for residential purposes); \$2000 for a residential building designed for occupancy by two families; \$3000 for a residential building designed for occupancy by three families; \$4000 for a residential building designed for occupancy by four families; \$5000 for a residential building designed for occupancy by five families.

Other permitted construction without authorization includes: \$1000 for an irrigation or drainage system serving more than one farm; \$5000 for a hotel, apartment or other residence for six or more families; \$5000 for an office, bank, store, laundry, garage, restaurant, theatre, warehouse or other retail or wholesale service establishment, including a frozen food locker plant; \$10,000 for a church, hospital, school, college; and \$25,000 for a factory, plant or other industrial unit, bus or truck terminal, overpass or underpass, research laboratory or pilot plant, etc.

PROVED ON OVER 400 UNITS

The ball-bearing principle of grinding on B&W Direct Firing Pulverizers

The ball-bearing principle of grinding combines crushing and attrition under controlled pressure. It produces the fineness of fuel necessary for efficient combustion at all rates of operation. This principle of grinding permits a wide range in size of pulverization and conditions of operation. The pulverizer is moderate in space requirement per unit of capacity.

B&W Type E Pulverizers are

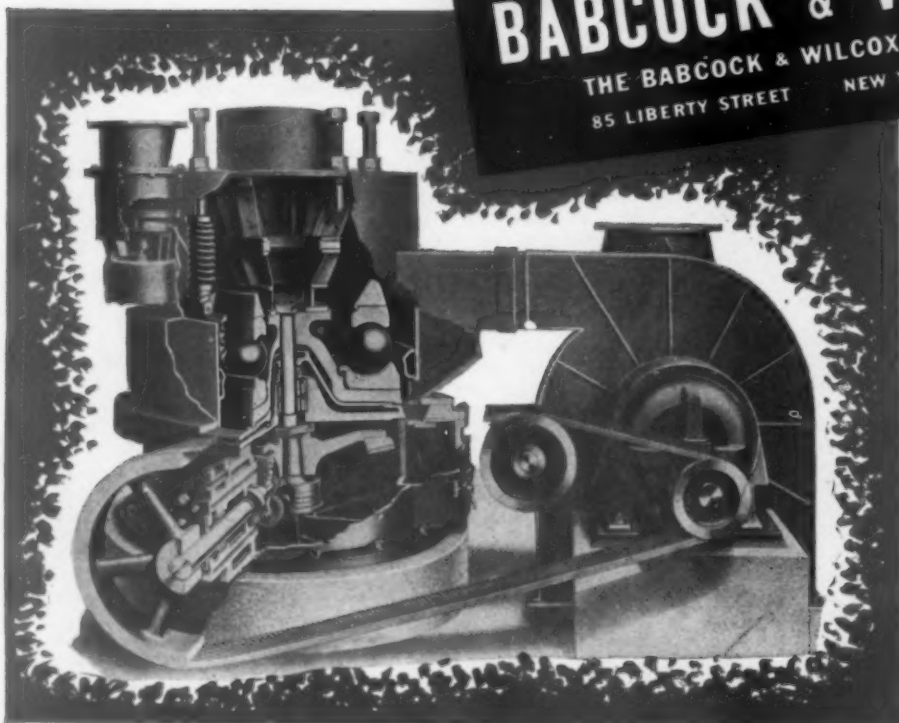
known for their:

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B&W's well-rounded experience in design, manufacture and installation of direct-firing pulverizers is at the service of cement plant owners and operators.

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Cut-away view of the B&W Type E Pulverizer

C-59

701

Rocky's NOTES

Agricultural Lime Promotion By Private Enterprise

WE seem to be in the middle of a three-way controversy caused by some statements made on this page in the April issue, in which, unfortunately, we indulged in some not strictly scientific comparison of the various forms of "agricultural lime." We said that hydrated lime contained about as much water of crystallization as limestone contained carbon dioxide.

Pure high calcium limestone of course contains

$$\left(\frac{\text{CaO}}{40 + 16} \right) + \left(\frac{\text{CO}_2}{12 + 32} \right)$$

or 56 percent calcium oxide (CaO) and 44 percent carbon dioxide (CO₂); while hydrated lime or calcium hydroxide

$$\left(\frac{\text{CaO}}{56} \right) + \left(\frac{\text{H}_2\text{O}}{18} \right)$$

contains nearer 75 percent calcium oxide on a pound for pound basis. Actually, of course neither the lime or the limestone is pure; probably on the average not much better than 90 percent pure, so that the comparison would then be on a 50.4 percent to 67.5 percent basis rather than 56 to 75. We will have to leave it to the reader to judge whether this difference is in the range of "poetic license" in discussing a subject in very general terms without pretense of scientific accuracy.

On the basis of something like 90 percent pure lime or limestone, hydrated lime, if purchased solely on its calcium oxide content, would be worth about 25 percent more than the same weight of pulverized limestone. This is solely on the relative neutralizing values of the two materials. The comparison would be somewhat more favorable to the hydrated lime in the case of dolomitic lime.

However, too many producers of agricultural liming materials think and talk and sell in terms of neutralizing acid soils exclusively. More and more agronomists have come to consider the most important function of a liming material as the source of supply of calcium, which is the most essential plant food in the production of proteins. If it were feasible to supply the metal calcium to the soil it would probably serve all the pur-

poses of any liming materials, for it would quickly oxidize or carbonate. Nevertheless, it enters the plant as calcium and not as CaO or CaCO₃, or Ca(OH)₂.

Figured on a calcium (plant food) basis calcium carbonate contains 40 percent and hydrated lime 54 percent in a pure lime, or 36 and 48.6 percent on a 90 percent lime basis. So, actually the hydrated lime is about one-third better than the limestone. In addition to that, the hydrated lime is of course much more finely divided than it would be possible to grind limestone.

I had better quit here, or I shall find myself in another controversy as advocating hydrated lime vs. ground limestone. So, I will turn the discussion over to Reed C. Bye, vice-president, Warner Co., who writes as follows:

"Dear Rocky: I was much interested in your 'Notes' in April Rock Products. Most particularly in your final question because it seems to me that the destiny of the agricultural liming industry depends entirely upon whether the Government is to be the only buyer of agricultural lime, or whether it has to be sold competitively to private consumers.

"The several groups agitating for a new national association to promote 'agricultural lime' most certainly do not have any intention of promoting the use of lime as private enterprise, because of the modest budgets proposed. Rather, it would seem that what is really desired is the organization of a pressure group to perpetuate the Government program under which they can sell a coarse ground run of quarry products at full capacity for sure cash to the Government twelve months of the year.

"Frankly, I don't think you gave those members of the lime industry who have long been interested in agricultural lime a very fair break. In great error is your statement 'hydrated lime contains about as much water of crystallization as limestone contains carbon dioxide, so the most forceful argument for using lime instead of limestone went overboard.' As a matter of fact, the best limestones contain about 50 percent

oxides, while good high calcium hydrates contain 71 percent, and good dolomitic hydrates run about 80 percent.

Quality Lime Institute

"Also, you say, 'Unfortunately, lime manufacturers insisted on regarding pulverized limestone as a competitive material, although any one of them could have produced agricultural limestone as readily as lime.' I thought you were fully familiar with the policies and the work of the Quality Lime Institute which has been functioning for nearly twenty years in the East and whose members have always produced pulverized limestone as well as burned lime.

"As a result of past experiences, the first plank in the platform of this Institute was that it would promote equally, all forms of quality liming materials. It set standards for pulverized limestone as to analysis and fineness, as well as for limes, and its staff consisting of a manager and two agronomists, promoted liming materials in general, the choice of the specific material to rest with the consumer after he was in possession of all of the facts.

"During the eighteen-year period, the Institute has expended more than \$300,000. Producer members have varied from twelve to sixteen companies, and dues have been based on the tonnage of lime and limestone sold at a two to one ratio.

"With the exception of minor overhead expenses for a small office and stenographer, every dollar has gone into the direct promotion of lime materials for the soil through agronomists making personal contacts with farmers, county agents, schools, 4-H clubs, colleges, etc. Hundreds of lectures have been given, supported by two talking films and a number of pieces of literature. Thousands of soil samples have been tested.

"The Institute has earned and holds an enviable reputation because of its broad and unselfish policies, which I am sure you can confirm at any of the Eastern colleges or with any of the county agents in the Institute territories. We have recognized that there is a place for all forms of liming materials and all forms have been available at fair prices commensurate with their cost of production and intrinsic value.

"I don't know whether you have been advised that the National Lime Association just appropriated an amount of about \$37,000.00 for pure basic research work with the State colleges of New Jersey, New York, Pennsylvania and Maryland. This will cover all forms of lime and limestone and is to be directed by the colleges. This certainly indicates a broad interest in the agricultural liming problem.

"The A.A.A. has, of course, increased the consumption of limestone tremendously, as would any free dis-

(Continued on page 92)



WAITING . . . 158,466 Miles of Roadwork

IMAGINE fifty transcontinental highways, or a road running *six times around the earth* at the equator. That will give you an idea of the estimated mileage of roads scheduled to be rebuilt, widened and relocated after the war. *And this is only one item in an estimated \$15 billion expenditure for postwar construction!*

To handle this unprecedented volume of work, construction equipment—old and new—must function at maximum efficiency, with minimum maintenance. Effective lubrication is the biggest single factor in assuring this . . . and, on the basis of experience, contractors everywhere use Texaco.

Texaco Marfak, for example, used in your tractors, shovels, bulldozers, trucks, etc., provides ideal film lubrication inside a bearing, yet maintains its original

consistency at the outer edges . . . sealing itself in, sealing out sand, dirt, water. Its tough adhesive film cushions bearings against road shocks. Makes parts last longer.

For wheel bearings, use *Texaco Marfak Heavy Duty*. It stays in the bearings—off the brakes. Seasonal repacking is no longer required.

Texaco lubricants have proved so effective in service they are definitely preferred in many fields, a few of which are listed at the right.

Texaco Lubrication Engineering Service is available through more than 2300 Texaco distributing plants in the 48 States. Get in touch with the nearest one, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

THEY PREFER TEXACO

- * More stationary Diesel horsepower in the U. S. is lubricated with Texaco than with any other brand.
- * More Diesel horsepower on stream-lined trains in the U. S. is lubricated with Texaco than with all other brands combined.
- * More locomotives and railroad cars in the U. S. are lubricated with Texaco than with any other brand.
- * More revenue airline miles in the U. S. are flown with Texaco than with any other brand.
- * More buses, more bus lines and more bus-miles are lubricated with Texaco than with any other brand.



TEXACO Lubricants and Fuels

TUNE IN THE TEXACO STAR THEATRE WITH JAMES MELTON EVERY SUNDAY NIGHT—CBS

Elected President

THOMAS ROBINS, JR., whose election to the presidency of Robins Conveyors, Inc., was announced in the May issue, was born in New York City in



Thomas Robins, Jr.

1896. He is a graduate of Groton School, class of 1915, and entered Princeton University, class of 1919, leaving in March, 1917, to enlist in the U. S. Navy. During the first world war Mr. Robins was promoted to lieutenant, served in command of a squadron of submarine chasers in the Irish Sea, and was awarded the Navy Cross. From 1919 to 1926 he was employed by Robins at Passaic, N. J. He became president of Hewitt Rubber Corp. in 1936, having been vice-president and general manager for several years prior. Mr. Robins was one of the founders and first directors of the Manufacturers Division of the National Crushed Stone Association and was quite active in the affairs of that organization in the 1920's.

Mr. Robins is a director of Hewitt Rubber Corp.; Robins Conveyors Inc.; National Synthetic Rubber Corp.; Federal Reserve Bank, Buffalo Branch; The Marine Trust Co. of Buffalo, and Niagara Share Corp.

Assistant to President

P. H. STAUB has been made assistant to President C. C. Loomis at the New England Lime Co.'s magnesium plant in Canaan, Conn. He will take over the duties of the late John L. Weber who died suddenly. Mr. Staub graduated from Cornell University where he majored in chemical engi-

neering. For the past three years he has been assistant superintendent and technical director at the plant and will continue to hold the latter position together with his new duties.

Elected Vice President

QUENTIN W. BEST has been elected vice-president of the Consolidated Rock Products Co., Los Angeles, Calif., as well as a member of the board of directors. Mr. Best received his schooling in Minneapolis and St. Paul and graduated from the University of Minnesota, taking a two-year special course at the Agricultural School. In 1922 he joined the staff of the Blue Diamond Corporation where he was service manager until 1927, when he resigned to accept a position as salesman for the Consolidated Rock Products Corporation. In 1940 he became sales manager after serving a period as assistant sales manager.

Lehigh Promotions

H. F. SHELLENBERGER, acting superintendent and chemist of the Lehigh Portland Cement Company's plant at Mitchell, Ind., has been made superintendent of that plant, succeeding the late H. H. Purkhiser, who died Dec. 31, 1944. Mr. Shellenberger has been in the employ of the Lehigh Portland Cement Co. since June, 1936, starting in the company's research laboratory at Ormrod, Penn. H. A. ZELIFF, chemist at the Birmingham, Ala., plant, has been appointed assistant superintendent and supervising chemist. Mr. Zelfiff has been employed by the company since 1938, starting as a research chemical engineer.

Warner Changes

JOHN DUNN has been named assistant treasurer of the Warner Co., Philadelphia, Penn., and has been placed in charge of all accounting and finance of the Bellefonte, Penn., office. Harry C. Taylor, formerly in charge of the storeroom, has been made purchasing agent and Robert McDowell has been named in Mr. Taylor's former position.

Dravo Promotions

W. A. BLISS has been elected vice-president and W. E. Clark has been appointed general manager of the Keystone Sand Division of the Dravo Corporation, Pittsburgh, Penn.

Named Sales Manager

JAMES G. LACY has been appointed district sales manager of the Missouri Portland Cement Co., at Kansas City, Mo., succeeding Ray H. Masters.

Association Changes

WM. M. KINNEY, general manager of the Portland Cement Association, Chicago, Ill., announces personnel changes which became effective June 15, 1945. M. J. McMillan, manager of the Washington office since 1936, goes to New York as regional manager of the Eastern offices. James E. Dunn, district engineer of the Richmond, Va., office since 1938, becomes manager of the Washington office. Gordon S. Maynard, field engineer in North Carolina and Virginia for the Association since 1937, becomes district engineer in Richmond, Va. E. M. Fleming, district manager in New York will work with Mr. McMillan.

Road Design Director

DWIGHT H. BRAY, who has been with the Kentucky State Department of Highways for the past 25 years, has been transferred from maintenance director to road design director to supervise the proposed \$75,000,000 postwar road building program. He will be succeeded by Harry D. Metcalf, who has been Ohio's chief engineer of road maintenance and repair.

In Africa

FRANK TURVEY, construction engineer of Baltimore, Md., who designed the new primary crushing and screening plant of the M. J. Grove Lime Co., Stephens City, Va., is now in Africa for the purpose of designing a stone plant.

Appointed Auditor

ARTHUR E. MARTIN has been appointed local auditor of the Hudson, N. Y., plant of the Universal Atlas Cement Co., succeeding the late Roswell F. Heth.



Walter Stauffer of National Lime Association, left, and Dr. Pidgeon, who developed ferro-silicon process for extracting magnesium from dolomite, at recent Canadian Institute of Mining and Metallurgy meeting

Cement Plant Improvements

VOLUNTEER PORTLAND CEMENT CO., Knoxville, Tenn., recently installed two Fuller air-quenching inclined-grate coolers to replace two rotary coolers. This installation will effect a saving of space as well as a possible saving of fuel and it is expected to improve grindability of clinker. This company feels that more economical maintenance will result from this installation.

Another recent installation was a Dixie hammermill, replacing an older hammermill, which has stepped up hourly production from 125 to 200 tons per hour. This mill, which is used for secondary crushing of raw rock, also has resulted in increased fineness.

Patent Agreement

WARNER CO., Philadelphia, Penn., and G. & W. H. Corson Co., Plymouth Meeting, Penn., have concluded an agreement for cross licensing the patented processes used in manufacturing pressure hydrated limes. Laboratories of both companies have been working on the development of a pressure process for hydrating lime, both companies receiving patents on the processes. Although the processes are not identical, they are similar and the two companies have agreed to adopt the best features of each and through the joint efforts of both companies, further improve the process.

Install Crusher

RIVERSIDE SAND & GRAVEL CO., Selah, Wash., recently completed the installation of a new crusher and other equipment in a modernization program. A Caterpillar equipped bulldozer and a Carry-all is used for stripping. The company, operated by Maurice Gredvig, owns 90 acres be-

tween the Riverside golf course and the Yakima river, all of which is underlaid with gravel. It is a wet-pit operation and just recently a new pit was opened on the property.

Wage-Hour Law Liability

ADMINISTRATIVE DIRECTOR J. R. Boyd of the National Crushed Stone Association has called attention to legislation introduced by Congressman Gwynne of Iowa which would afford protection to those who entirely in good faith and to the best of their knowledge and belief had conformed to administrative regulations with regard to the Wage-Hour Law, only to find that under a broadened interpretation they may be liable to such penalties as can put them out of business. Support of this bill is urged. The Gwynne bill H. R. 2788 would amend the judicial code to establish time limitations within which public and private actions based upon federal law could be brought. For public actions, the time would be two years after the cause of action accrued, and for private actions, one year after such cause of action accrued, unless a shorter time be fixed in any applicable State statute.

Talc Claim Option

OPTION has been taken on a group of talc claims in the Ubehebe district near Keeler by James O. Greenan, prominent Nevada mining operator. Geological sampling has shown the presence of high quality talc suitable for the manufacture of cosmetics, as well as large deposits of steatite, in demand as high frequency radio-electric insulation. Preparations are now being completed for immediate production. Mining engineers report that this district promises to become one of the foremost talc producers in the world. Roscoe C. Wright, known as Death Valley Curley, who located the claims, reports discovery of another

promising talc area east of Dodd Springs, east of Keeler.

Gravel Plant for Sale

WALSH SAND & GRAVEL CO., Menominee, Mich., at one time a large producer of aggregates in that area, is to be sold. The sand and gravel property comprising 158 acres of land, machinery and equipment, is located near Walsh. This is the last major holding of the farflung empire of John Marsch, Chicago contractor, railroad builder, financier, and diplomat. Mr. Marsch is a special consul of the Duchy of Luxembourg in the Middle West, and plans to visit the Duchy this fall where he has an estate.

Modernizes Agstone Plant

WAUKESHA LIME & STONE CO., Waukesha, Wis., has recently installed a new 3-ft. short head Symons cone crusher powered by a 75-hp. motor through V-belt drive. All open gearing on conveying equipment has been replaced by Link-Belt herringbone speed reducers.

To the quarry operation has been added a new P. & H. Model 955 Diesel shovel. A new 500 amp. P. & H. welder and accessories is making it possible to effect weld repairs with plant personnel.

Buy Crushed Stone Plant

HILLYARD LIMESTONE PRODUCTS CO., Parsons, Kans., is the new name of the crushed stone business formerly conducted by Minton Construction Co. The plant was recently sold by Earl Minton to Mr. Hillyard, former chief of police of Parsons, Kans., who retired from this office on April 16. This crushing plant was formerly operated by Ray Hardman.

Big Gravel Contract

Two big contracts were recently awarded for sand and gravel and crushed stone by the Montana Highway Commission. McLaughlin, Inc., Great Falls, was low bidder at \$38,595 for furnishing 45,000 cu. yds. of crushed gravel in Lewis and Clark, Teton and Cascade counties. Chas. Shannon & Son was awarded a contract for 53,000 cu. yds. of crushed gravel on a bid of \$48,902.

New Block Concern

ART SCHMITT of Eureka, S. Dak., is now manufacturing concrete block with a tamper type machine. He has a considerable backlog of orders which will keep the plant busy for some time.

Buys Crusher and Drive

COURTNEY AND PLUMMER of Neenah, Wis., have recently purchased a 24-x 36-in. Telsmith crusher and a 100-hp. Westinghouse motor for the drive, in line with plans to revamp and increase the capacity of the stone plant.



Crushing and screening plant of Geo. W. Kerford Quarry Co., showing carloading track and chute to outside bins for truck loading to facilitate agstone distribution

Roofing Granules

REPORTS of producers to the Bureau of Mines shows that the output of roofing granules was 13 percent greater in 1944 than in 1943, and totalled nearly a million tons. Artificially colored and brick granules increased 17 and 38 percent, respectively, while the tonnage of natural granules was virtually the same as in 1943.

The production of natural granules in 1942 was 352,320 tons, which declined to 287,090 tons in 1943, and then to 287,084 tons in 1944. Brick granules increased from 43,230 tons in 1942 to 47,650 tons in 1943 and then to 65,827 tons in 1944. Artificially colored granules increased from 538,310 tons in 1942 to 543,870 tons in 1943 and to 637,089 tons in 1944. The total of the three shows a decrease from 1942 to 1943 from 933,860 to 878,610 tons. The jump from 1943 to 1944 shows that production in 1944 was even greater than in 1942. In 1944 the total produced was 990,000 tons.

Reopen Fluorspar Mine

CHAFFEE COUNTY FLUORSAP CORPORATION, Salida, Colo., has reopened its mine which was abandoned a few years ago. New crushing and sizing equipment has been added which will make it possible to produce a metallurgical grade of fluorspar as well as the ground spar now being produced in the company's flotation milling plant in Browns Canon.

Work Gypsum Quarry

WESTERN GYPSUM PRODUCTS CO., LTD., Cranbrook, B. C., is making arrangements to work a gypsum deposit near Mayook. Plans call for the employment of 20 to 30 men to work the deposit the year around as an open quarry.

Will Produce Ballast

MAX J. KUNEY CONSTRUCTION CO., Spokane, Wash., has leased property in Big Timber, Mont., and will erect crushing and screening equipment to produce railroad ballast for the Northern Pacific Railroad, using the large boulders which abound in this area.

Ground Mica Prices

CEILING PRICES for ground mica have been increased by \$5.00 per ton by the O.P.A., covered by Amendment 6 to MPR 347. The higher price became effective May 28, 1945, and applies to all sellers of ground mica. Increases in labor, raw material, and other costs necessitated the increase in price.

Gypsum Development

SULPHUR SPRINGS GYPSUM CO., near Thermopolis, Wyo., recently shipped a carload of gypsum to western Montana for agricultural purposes. H. J. Adams, general manager of this company, also announced that \$20,-

000,000 was spent on a plant and town at Blythe, Calif., for the purpose of developing building material out of gypsum.

Open Ready Mix Plant

SCIOTO LIME & STONE CO., Delaware, Ohio, has set up a plant to furnish ready mixed concrete. The Delaware Farmers Exchange has been designated as the agent for Scioto Lime & Stone Co., for ready mix sales, and service will be available through the exchange offices in Delaware, Radnor and Lewis Center, Ohio.

Start Cement Operations

LONE STAR CEMENT CORPORATION, Bonner Springs, Kans., plant resumed operation on May 1, according to J. A. Fairchild, superintendent.

CONSOLIDATED CEMENT CORPORATION, Fredonia, Kans., is now in production after a shut-down of several months during which extensive repairs were made.

Buy Quarry

H. A. TYSON, London, Ohio, owner of the former Hagar Straw Board and Paper Co. plant and lands, has purchased the stone quarry at Cedarville, Ohio, from L. B. Smith, Camp Hill, Penn., quarry operators and contractors. The quarry was abandoned in 1942 when its operator, Capt. C. P. Elgin was commissioned in the army.

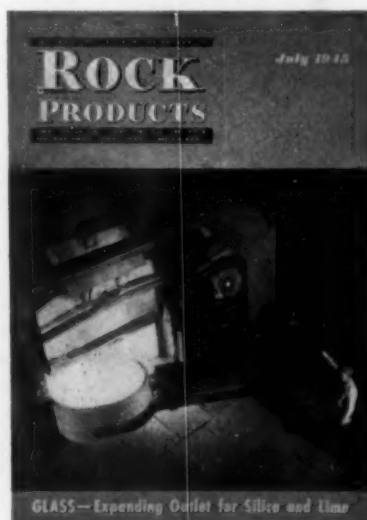
ROCK PRODUCTS Announces Change in Corporate Name

Without undergoing any change in ownership, corporate structure or personnel, the publishers of ROCK PRODUCTS have adopted the corporate name MACLEAN-HUNTER Publishing Corporation, replacing the previous name Tradepress Publishing Corporation.

Purpose of the change is to identify the corporation more closely with its associated companies in Canada and England, known as MACLEAN-HUNTER Publishing Company, Ltd.

Other former Tradepress publications, Inland Printer, Chemical Industries and American Hairdresser will also operate under the new corporate name.

Horace T. Hunter remains as president under the new corporate name, with John R. Thompson continuing as vice-president and general manager. The entire staffs of all of the individual publications also continue as before.



Front Cover

ON THE FRONT COVER of the July issue of ROCK PRODUCTS is illustrated a part of the pot-casting method for producing plate glass in the Rossford plant of the Libbey-Owens-Ford Glass Co., Toledo, Ohio. From the furnace is drawn a ton of white-hot glass. The clay pot containing the glass is drawn out by a huge steel claw operated by an overhead crane and carried to steel rollers which spread out the viscous mass into large sheets. The raw batch—silica sand, soda ash, lime and other ingredients—is fed into the pots and gas flames liquefy the materials into glass by a temperature of approximately 2700 deg. F.

This illustration was selected for the July cover as it focuses attention on the glass industry which is a major market for industrial sands and a substantial outlet for other rock products, including lime, feldspar and other minerals.

W.P.B. Names Bottlenecks

INCLUDED in a list of 101 items named as potential bottlenecks to war-supporting and high-urgency civilian manufacturing programs are certain grades of mica and fibrous talc. Recommendations on how to minimize the limiting effects of short supply items on production are expected to be made by the Joint Committee for Critical Material and Products.

Increases Agstone Capacity

THE ROCK HILL STONE AND GRAVEL CO., St. Louis, Mo., has changed ownership. The new company is the Rock Hill Quarries Company. Andrew T. Smith, who has been connected with the Universal Atlas Cement Company for the past 21 years, is president, and C. A. Hurt is assistant secretary and treasurer.

A.I.M.M.E. Papers

THE FOLLOWING PREPRINTS of papers of interest to the rock products industry which were to have been given at the 1945 annual A.I.M.M.E. convention in New York City have been made available.

One of the papers, "Short Rod Grinding in Ball Mills," by H. R. Stahl, Tech. Publ. No. 1821, A.I.M.M.E., presents operating data on the crushing of galena-bearing dolomite comparing the performance of a ball mill used as such to that of the same machine converted to a rod mill. It was found that rods reduce the quantity of galena slimes for the same amount of liberation, when operating on light pulp. A comparison follows:

Size	Ball Mill	Short Rod Mill
Plus 20.....	8-12%	4.3%
Minus 100.....	25-30%	18.5%

Design changes and specifications to make the conversion are described in some detail, as well as discussion of advantages gained in the flow-sheet.

"Mining Operations of the Montana Phosphate Products Co.," by Geoffrey Gilbert, Tech. Publ. No. 1824, A.I.M.M.E., discusses the operations located northeast of Garrison, Powell County, Montana. These deposits consist of 3-4 ft. layers of phosphoria overlain by Jurassic shale and underlain by Pennsylvanian quartzite and Mississippian limestone. Short tunnels into the hillside at different levels are expanded by drifting along the bed. Room and pillar mining is used up the dip and the rock drilled with stoper machines. Broken rock is scraped into chutes. Haulage from chutes is different at different levels, the lowest level of 5200 ft. being served by a Mancha locomotive, the highest or 5800-ft. level by an inclined tramway to the bunker level of 5300 ft., and the intermediate levels by horses. Transportation from bunkers to rail line is by truck.

Two mines are being operated while a third is under development. Production to date covering a number of years has been upward of 700,000 tons, the bulk of it grading 69.5 percent B.P.L. but with a definite tonnage averaging 72 percent B.P.L.

Of great interest to those who plan to supplant more common prospecting methods with the diamond drill is the paper, "Diamond Drilling in Exploration and Development," by R. S. Moehlman, Tech. Publ. 1858, A.I.M.M.E. This is a detailed report on the use and limitations as well as the operation of diamond drilling equipment. Costs under various conditions are analyzed and examples taken from practice. The author goes to considerable length into core and

sludge assays, and correlation of drill hole results, making it a valuable contribution to the literature of prospecting.

Soundness Test for Hydrated Lime

NATIONAL BUREAU OF STANDARDS has announced that an investigation has been undertaken to develop an accelerated autoclave test for the purpose of differentiating hydrated limes which can cause a marked expansion, with resulting failure in the finish coat of plaster, from those giving little or no expansion. With the test procedure that has been developed, 57 different limes have been mixed with one brand of portland cement, cast into bars, and the expansion of the bars after autoclaving has been determined. In addition, 32 of the limes have been tested, in part with 18 other cements. A total of 148 determinations have been made.

It has been found that all of the "regular dolomitic hydrated limes" that have been causing trouble, regardless of the cements used, gave expansions ranging from 4.7 to 16.4 percent. When these dolomitic hydrated limes are properly hydrated and the free MgO reduced to 5 percent or less, net expansions were (with two exceptions) less than 0.5 percent, after deduction of the expansion of the cement used. The exceptions applied to those cements which gave the larger expansions when tested without the addition of the lime. Every high-calcium hydrated lime, regardless of the cement used, gave expansions less than 0.5 percent.

Thus it would appear that when the proper cement is used, a satisfactory autoclave test has been developed for determining the soundness of hydrated limes.

Reopen Quarry

GROSSHANS & PETERSEN, railroad contractors of Marysville, Kans., have reopened the quarry north of the Commander-Larabee mill. A railroad spur has been built to the quarry which is expected to produce five or six carloads of rock daily. The rock will be used to rip-rap Union Pacific Railroad grades in the Kansas division.

Purchases Block Plant

ART KUNKEL has purchased the Quincy Building Materials, Quincy, Ill., producers of concrete block and silo staves. Ray Campbell is manager of the plant.

Reopen Cement Plant

WOLVERINE PORTLAND CEMENT CO., has announced that the Coldwater plant will be reopened in the near future on a full production basis, due to the increased demand for cement.

New Agstone Concern

MACON LIME PRODUCTS CO., Macon, Miss., is the name of a new company which plans to produce agricultural limestone and other products. Oscar Bloom of Macon, Miss., is one of the organizers of the company.

Building Silica Plant

SILICA PRODUCTION CO., Greeley, Colo., has started building its new plant 11 miles northeast of Keota. Five 5-ton Macks have been purchased for hauling the sand. A power-house and garage is now being built at the mine site.

Bituminous Mix Contract

MEMPHIS STONE AND GRAVEL CO., Memphis, Tenn., was awarded a contract to construct seven miles of bituminous surface road in Mississippi County when the Arkansas Highway Commission recently accepted the company's bid of \$70,-435.93.

Vacations with Pay

JACKSON SAND MINING CO., Jackson, Ohio, will give a week's vacation with pay to all employees who have worked for the company a year, and a two weeks' vacation with pay to all those who have been employed five years. This arrangement was made following a recent ruling of the War Labor Board.

Dixie Improvements

PENNSYLVANIA-DIXIE CEMENT CORPORATION plans to make extensive improvements and additions to its plants at Kingsport and Richard City, Tenn., and Clinchfield, Ga., to cost approximately \$3,000,000.

Crushing Shells

THE BOGUE CHITTO-PEARLY RIVER soil conservation district has established a shell crushing plant at Shidell, La., to produce agricultural liming material. This supplements for southern Louisiana, the agricultural limestone crushing operations of northern Louisiana.

Buys Alkali Concern

PITTSBURGH PLATE GLASS CO., Columbia Chemical Division, has acquired the plant and sales organization of the Pacific Alkali Co. The recently acquired company has a plant at Bartlett, Calif., where it has been making soda ash, borax and sesqui carbonate of soda.

Wool from Slag

INDEPENDENT INSULATIONS INC., Seattle, Wash., will begin production of mineral wool from slag from smelters at Tacoma within the next few months. Facilities of the Defense Plant Corporation will be used on authority from Washington, D. C.

Awarded Bronze Star

COLONEL CHARLES A. SELBY, secretary-treasurer of Wininger and Selby, Inc., and treasurer of the Nicholson Co., Inc., both of New York City, has been awarded the Bronze Star Medal for meritorious achievement in connection with military operations against the enemy on Kwajalein Island and Eniwetok Atoll, Marshall Islands Group. Colonel Selby is a member of the General Staff Corps, Pacific Ocean Areas. He is a graduate civil engineer from the University of California.

Lease Gravel Pit

CLINKER SAND & GRAVEL Co., Seattle, Wash., has leased the gravel pit on Hat Island in Puget Sound from Hat Island Sand & Gravel Co. The new lease-holders contemplate renewing present dock facilities and rehabilitating other facilities at the pit where operations have been inactive for some time.

Buying Crusher

THE HAYES CONSTRUCTION Co. has announced through Frank Snyder, manager, that a new hammermill will be purchased for the quarry near Bethany, Mo., to increase production of agricultural limestone by about 30 percent.

Make Roofing Granules

MINNESOTA MINING & MANUFACTURING Co., plans to spend \$4,000,000 on postwar expansion. The St. Paul, Minn., plant will be enlarged and a colored-quartz roofing granules factory will be built in the South.

Acquire Phosphate Plant

VIRGINIA CAROLINA CHEMICAL CORPORATION, Richmond, Va., has acquired the Phosphate Mining Co. of Florida, thus adding to its reserve of phosphate rock. The Florida property cost \$2,800,000.

Enlarge Bentonite Plant

F. E. SCHUNDLER BENTONITE Co., Belle Fourche, S. D., is adding a fourth grinding mill and a fifth drier to its plant. It is expected that capacity will be increased by one-third.

Safety Contest

WARNER Co., Philadelphia, Penn., has inaugurated a Safety Suggestion Contest which will run from July 1 to Sept. 1. Suggestions rated as the best during the two-month period will receive monetary awards.

Cement Contract

RIVERSIDE CEMENT Co., Los Angeles, Calif., has the contract for 100,000 bbls. of modified portland cement to be used for lining the Coachella

Canal and for work on the Imperial Dam. The total net delivered cost to the federal government for the cement is \$265,950.

New Rock Crushing Plant

JACK SIMPLOT, Pocatello, Idaho, owner of the Simplot Fertilizer Co., will open a phosphate rock crushing plant in Pocatello. The steel and reinforced concrete structure, which will cost about \$100,000, is now being built.

Agstone Plant

JOHN STARK has moved crushing and screening equipment from Tennessee to a quarry location nine miles from Girard, Kans. The plant will have a capacity of 75 tons an hour. Operation was scheduled to start May 1.

Buys Stone Property

MAMARONECK STONE CORPORATION has purchased the property at Harbor Island, N. Y., formerly operated by the General Sand and Stone Corporation. Improvements are to be made to the plant.

Installs Power Plant

CARL HANSEN, Calamus, Iowa, has installed an electric power plant and new equipment which has increased agricultural limestone production to 400 tons per day.

Start Gravel Concern

PARKER J. WOLFE has organized the Dry Creek Crushed Gravel Co., with a plant on Route 133 near Dry Creek, Ohio. Mr. Wolfe was formerly associated with the late Edward Noelp, operator of the Newark Sand and Gravel Co.

Re-Elected Director

ROBERT G. RAUSCHER, comptroller and assistant treasurer of the Warner Co., Philadelphia, Penn., has been re-elected a Director of the Philadelphia Control of the Controllers Institute of America for the fiscal year 1945-1946.

Society Appointment

J. L. MINER of the Atlas Lumnite Cement Co., New York, N. Y., has been appointed a member-at-large of Committee E-8 on Nomenclature and Definitions, A.S.T.M., succeeding Cloyd M. Chapman, deceased.

Install New Equipment

GARNETT ROCK Co., Garnett, Kans., is installing new equipment to handle a contract to furnish the A.A.A. with all lime needed in Anderson County.

Open Quarry

SNATER-SMITH QUARRY near Macedonia, Iowa, was recently opened to produce crushed stone, 65 percent of which will be agstone.

Cement Production

BUREAU OF MINES reports that production of finished portland cement during April, 1945, totaled 7,084,000 bbl. or 10 percent above production in April, 1944. The output advanced 11 percent over March, 1945, and follows very closely the trend of the 1935-39 average. Production in April was below demand and stocks decreased 810,000 bbl. from the March total. Mill shipments of 7,894,000 bbl. were 7 percent above the corresponding month of the previous year. Mill stocks of finished cement at the end of April, 1945, totaled 20,778,000 bbl., a decline of 14 percent from the stocks of the corresponding month of 1944.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of April, 1945, and of April, 1944:

	RATIO (PER CENT) OF PRODUCTION TO CAPACITY				
	Apr. 1944	Apr. 1945	Mar. 1945	Feb. 1945	Jan. 1945
The month	32.0	36.0	31.0	29.0	31.0
12 months	46.0	38.0	37.0	37.0	37.0

Pavement Yardage

AWARDS of concrete pavement for May, 1945, have been announced by the Portland Cement Association as follows:

	SQUARE YARDS AWARDED	
	During May 1945	During 1st Five Mos. 1945
Roads	690,210	1,598,888
Streets and Alleys	345,062	1,200,267
Airports	1,030,294	2,995,125
Total	2,065,566	5,794,280

Associate Professor

L. K. HERNDON, secretary of Committee C-7 on Lime, A.S.T.M., has been made associate professor of Chemical Engineering of Ohio State University, Columbus, Ohio. He was formerly assistant professor.

Start Agstone Operations

BEU & SONS are opening a quarry near Conrad, Minn., and will set up a portable crushing plant to produce agricultural limestone. This company has been operating at the Rieken quarry in German township.

Adds Trucks

SCHUSTER QUALITY CONCRETE Co., Green Bay, Wis., has added three new trucks to its fleet; an 8-cu. yd. G.M.C., and two 5-cu. yd. G.M.C. dump trucks.

Purchase Transit Mixer

VALLEY READY MIXED CONCRETE Co., Appleton, Wis., recently bought a 4-cu. yd. T. L. Smith mixer mounted on a Ford chassis equipped with a Thornton drive.

HINTS *and* HELPS

Practical Ideas Developed by Operating Men

Transfer Ramps Cut Haul

TO SAVE WEAR on transit mixers and to do more work with fewer mixers, as well as to serve jobs outside the metropolitan area, the Dallas Concrete Co., Dallas, Texas, has



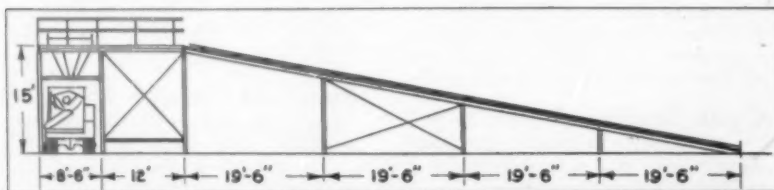
Showing structural steel ramp for loading mixer trucks from hopper filled with aggregates by dump trucks

found that transfer ramps are extremely useful. The transfer ramp, shown in the illustrations, is a platform with a runway which serves to transfer dry batches from dump trucks to transit mixers.

Where the length of haul precludes the use of transit mixers making the trip from central plant to the job, a ramp is erected close to the job and the mixers are used only between the ramp and the job. By this method, fewer mixers are needed, the amount of concrete hauled is increased, delivery is speeded, and maintenance costs are cut.

Dump trucks, which have a lower operating cost, receive sand, gravel, and cement at the central plant and deliver to the hopper located under the platform of the transfer ramp. Here the hopper discharges the load to the transit mixer together with a measured quantity of water from a tank. The delivery hopper is just large enough to carry one batch, which insures the correct amount of aggregates being delivered to the mixer.

The transfer ramp has a substructure of steel beams which are bolted together upon arrival at the chosen site. The platform and runway consists of 2- x 8-in. planks which are prefabricated into 6-ft. sections.



Dimensions of ramp used at outlying jobs to dump from hopper into the mixer trucks

Each section has holes corresponding to similar holes in the stringers of the framework. Carriage bolts secure the ramp and platform to the substructure. The platform and ramp are 12 ft. wide and have wooden curbs on either side to insure safety when the dump trucks back up the ramp. The platform, which is 20 ft. long and 15 ft. high, has railings as a safety feature. The ramp is 79 ft. long, thus allowing a safe degree of slope. For stabilizing the framework, $\frac{3}{4}$ -in. rods are used as cross members on two of the six sections, as shown in the diagram. Turnbuckles produce tension in the rods.

The legs of the substructure are placed on concrete footings which are 20 in. square and average 6 in. in thickness. The entire ramp can be assembled by four men in two to three days.

On jobs requiring 4000 cu. yd. of concrete or more, the ramp is assembled near the job site and the transit mixers are sent there to receive the dry batch. Dump trucks, some of which are rented, then receive the aggregates and cement at the central plant and deliver to the ramp for transference to the transit mixers through the delivery hopper. A 3000-gal. water tank with an automatic meter deliver the proper amount of water to the mixer, which then makes the short run to the job. Local water supply is used where possible but this company has dug wells where city water was not available, with small pumps to deliver to the tank.

The transfer ramp has been in service by this company since 1938. C. D. Brown, manager of the Dallas Concrete Co., and originator of the ramp, feels that from 50c to 75c per cu yd. of concrete can be saved by this arrangement.

Fine Sand

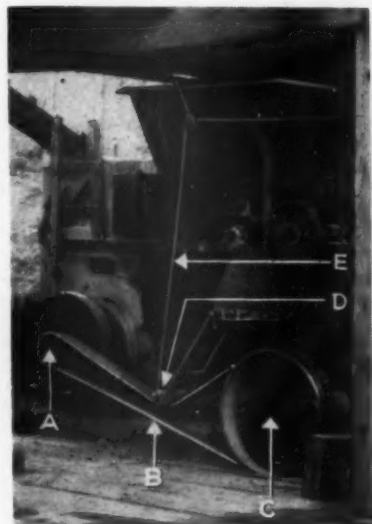
WITH Government specifications requiring a greater percentage of fines in sand, some plants are experiencing difficulty in meeting these demands. This trouble is not affecting a large sand and gravel company in Kansas, since a 6-ft. vein of very fine

sand has been found in five acres of its property. Sieve analysis shows that 85 per cent will pass a 200-mesh screen. It is possible, therefore, to reach any desired specification in blending this fine sand with the regular product.

Regulates Choke Feeding

ONE Midwest agstone producer operates a pulverizer at full load continuously by using a feeder rate slightly in excess of pulverization rate. To prevent choking to the point of causing trouble the following device is used:

Referring to the illustration, power from a Diesel engine is transmitted to the end of the pulverizer shaft (A) opposite the end visible in the illus-



Arrangement to control crusher feeding

tration by means of the flat twisted belt shown in the background. The shaft extension (A) with flywheel and pulley at the left delivers power to the pan feeder under hopper through belt (B) driving counter-shaft (C). A weighted idler (D) with hinged frame puts the proper tension on this belt. Cable (E) fastened to the idler frame extends conveniently back to the vicinity of the engine, as the operator spends most of his time there. As soon as the choking action slows down the engine the idler is raised off of the belt by pulling the cable, relieving the former, hence cutting off transmission to countershaft and stopping feeder action. As soon as the engine is again up to speed the idler is dropped down onto the belt and feeder again functions. This operation is a matter of seconds.

How to Figure Angular and Vertical Flat Belt Drives

By W. F. SCHAPHORST

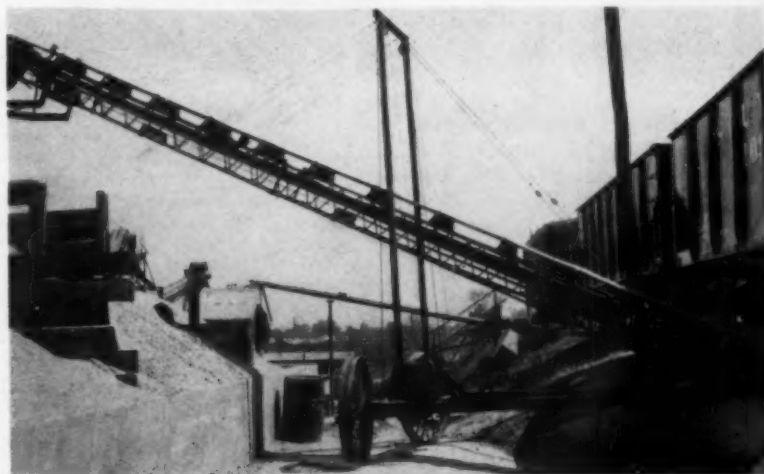
RULES for figuring horsepower are always based on flat horizontal belts, not on vertical or sloping belts. The question was recently asked, "How much percentage, if any, should one deduct when the belt runs at a 45 deg. angle?" The case in question involved a pump drive with the belt running so tight that the metal fasteners kept pulling out.

The answer is as follows: To find the capacity of a vertical or inclined drive, for which the angle to the horizontal is greater than 40 deg., subtract the angle of inclination from 140. The result is the percentage of capacity of the belt as compared with a horizontal belt of the same size. Thus, where the angle of inclination is 45 deg., as in this case, 140 minus 45 equals 95 percent, which is the capacity of the belt at 45 deg.

Applying this rule to a vertical belt, 50 percent would be deducted. Although 50 percent looks pretty steep, for year in and year out service it is recommended for most drives.

Anti-Rust Compositions

RUST PREVENTING and rust inhibiting compositions which also possess lubricating qualities are described by R. H. Bruni and J. W. Jones, in U. S. Patent 2,366,486. These glycerine-containing compositions, which may be painted, sprayed or otherwise applied, will protect iron or steel pipes and fixtures that are subject to moisture and dampness from rusting for an indefinite period of time. These compounds are also said to be



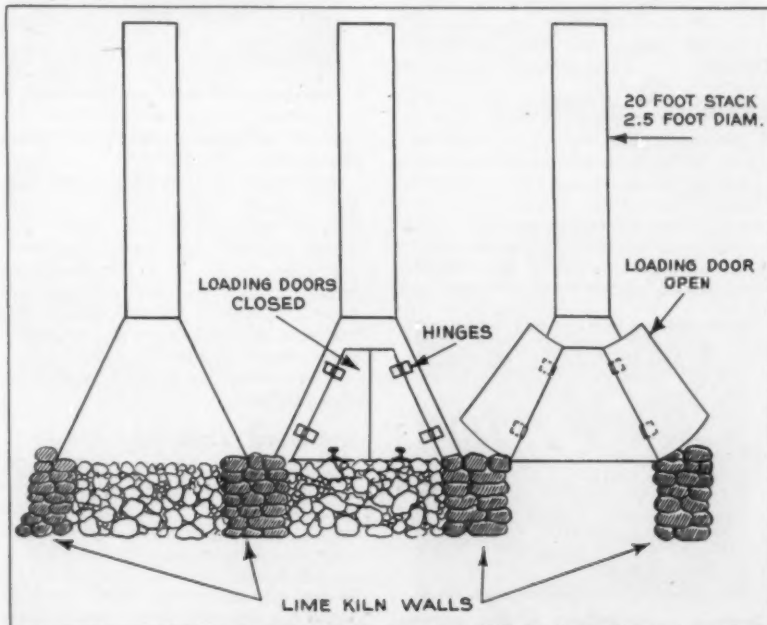
Wheels attached to A-frames permit stockpiling belt conveyor to swing in arc to fill various bin compartments with aggregates received by rail

useful in preventing bolts and nuts from corroding, thus facilitating their removal when desired. A product specifically designed for this last purpose, but typical of the other anti-rusting compounds described, consists of: Graphite, 2½ oz.; glycerine, 2 oz.; alcohol, 1 oz.; manganese resinate, 7 gr.; and liquid japan, 220 gr.

Lime Kiln Stacks

By J. F. PRUYN

A WESTERN PRODUCER of lime increased the capacity of the kilns by installing the inexpensive stacks shown in the illustration. The hinged doors are large enough to permit charging the kilns directly with mine cars.



Details of lime kiln stacks with hinged doors designed for direct charging with mine cars

Swinging Conveyor

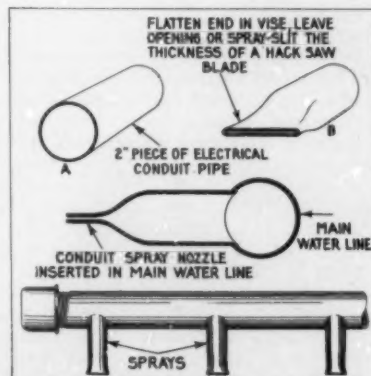
GREENVILLE CONCRETE Co., Greenville, S. C., has constructed a wheel mounted frame for a belt conveyor to permit movability. This frame, as shown in the accompanying illustration, allows the conveyor to swing in an arc so that material unloaded from railroad cars may be sent to either of several storage bins. The upright part of the frame is attached to the conveyor by steel cables while small I-beams connect the lower part of the conveyor to the wheels.

Sprays Made from Conduit

By J. F. PRUYN

A VERY SIMPLE and efficient spray nozzle may be made from short pieces of electrical conduit pipe. Just crimp the end of the pipe in a vise. Leave an opening large enough to insert a hack saw blade.

These nozzles may be inserted in a cast iron pipe if a bank of sprays is needed as those used on screens, discharge end of a bucket conveyor, etc.



Showing how makeshift spray units can be made from conduit pipe

NEW Machinery

New Diesel Engine Series

JOSHUA HENDY IRON WORKS, Sunnyvale, Calif., has brought out its Series 20 Diesels in 6- and 8-cyl. models with a power range of from 190 to 250 hp. at 900 r.p.m. Horsepower

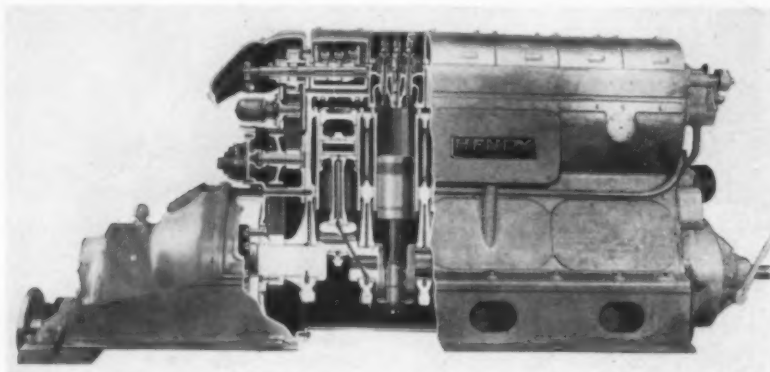
culated by a centrifugal pump which passes it first through the oil cooler and thence into the engine water header, which is cast integrally in the side of the cylinder block. Entrance of the water to each cylinder space is through a metering hole

eliminates the possibility of accidental contact with the welding circuit.

It is designed for electrodes up to and including $\frac{1}{4}$ in. in diameter, it is light in weight (15 oz.), and cool in operation. A slight twist of the hand tightens or releases the electrode. The width of the electrode slot limits the size of the electrode which can be inserted, thus preventing overloading, one of the evils which materially shorten the life of electrode holders.

Mobile Shovel

LINK-BELT SPEEDER CORPORATION, Chicago, Ill., has announced its wheel-mounted shovel-crane model UC-55 which was developed to provide high mobility and speed. It can be driven over the highway at speeds up to 10 miles per hour. Although a $\frac{1}{2}$ -cu. yd. machine, it has a lifting capacity of 6 tons; an overall width of 8 ft., wheel base 7 ft. 6 in., and overall weight equipped as a shovel of 26,350 lbs. It is mounted on dual



Cross-section view of Diesel engine showing design details

ratings are now available from 190 to 780-hp.

The D-26 and D-28 engines are made in marine, stationary, and Diesel-electric models, and are of the four-stroke cycle type, designed for heavy-duty, medium-speed operation. Like the larger engines, they are air starting, completely enclosed and have overhead camshaft, unit fuel pumps and injectors, precision-type bearings, and full pressure lubrication. Marine models are direct reversing.

Engines are of cast-iron, monoblock construction with underhung crankshaft, removable cylinder liners, and auxiliary drives arranged at either end. They are entirely self-contained, with all main accessories engine mounted. Among the attached accessories are air compressor, governor, water and lubricating oil circulating pumps, fuel-transfer pump, lubricating and fuel-oil filters, lubricating oil cooler, and gauge board.

Series 20 engines are single-acting, with $7\frac{1}{4}$ -in. bore and $8\frac{1}{2}$ -in. stroke. Cast-iron pistons have four compression and two oil-control rings. Full-floating wrist pins are pressure lubricated through drilled connecting rods, which are forged of high-strength steel. The crankshaft is cast iron, with hollow crank pins and main journals. Lubrication is carried from the main journals to the crank pins through inserted steel tubes.

Fresh-water cooling is a design feature of these engines. Raw water enters the raw-water pump, passes through a heat exchanger and is discharged. The fresh water is cir-

cled which gives a tangential swirl around each cylinder liner. It next passes from the cylinder block through two pass-overs to the cylinder heads, where it is directed for maximum cooling of the injectors and exhaust valves. The exhaust manifold which serves as a pickup for collecting the water from each cylinder head, directs the water through the heat exchanger to the circulating pump for recirculation. Temperature control is maintained by a control valve placed in the line between the heat exchanger outlet and the circulating pump.

Armor-Clad Holder

GENERAL ELECTRIC Co., Schenectady, N. Y., has announced an armor-clad (screw type), insulated electrode holder. A feature of the new holder is its head which is enclosed in a sheath of aluminum armor. It is claimed that this armor protects the insulation, resists weld spatter, and



Electrode holder designed to keep operator fatigue to a minimum



Convertible shovel for rapid movement

wheels, with 10 x 20 12-ply pneumatic tires.

Easy steering is accomplished from the operator's position in the crane cab by hydraulic power. Other features include automatic hydraulic stabilizers which lock the oscillating front axle in any position, and also power hydraulic brakes which lock machine against involuntary movement when digging.

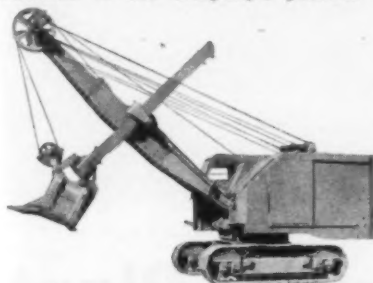
It is convertible to all conventional attachments.

Improve Batching Plant

THE C. S. JOHNSON Co., Champaign, Ill., has announced an improved concrete batching plant. The Porto Batcher, previously described and illustrated, is now equipped with a 5-cu. yd. truck receiving hopper and a 90-ton per hour aggregate elevator. Total bin capacity is 45 tons in three compartments.

Postwar Shovel

KOEHRING Co., Milwaukee, Wis., has announced its No. 605 1½-cu. yd. shovel-crane-dragline as the second addition to the company's postwar



A 1½-cu. yd. shovel-crane-dragline

line. This machine was preceded by the No. 205 ½-cu. yd. excavator.

Main drum clutches of the 605 are said to be a new, improved design. With the power engaged but manually released, the clutches enable the operator to retain the "feel" of the load at all times. Independent power or live boom control or a combination of both are available. The shovel dipper trip is the pawl-and-ratchet type. Crowd-retract and swing-traction clutch levers work easily with the new double fulcrum linkage. The high "A" frame on the 605 is raised or lowered by power. Main shafting on this machine is straight. Separate crawler frames give the lower assembly added flexibility. Another feature of this model is that the shovel boom has an improved foot shock absorber. The dragline fairlead is pin-mounted for quicker conversion.

Air Filter Cleaner

TURCO PRODUCTS, INC., Los Angeles, Calif., has developed a chemical cleaner known as Turco Aktiv for reconditioning air filters of various types used in air conditioning and also on stationary, marine, automotive, and aircraft engines. Dirty filters are immersed for six minutes in a cold bath, comprising 4 oz. of compound to 1 gal. of water, and given a cold water hosing to flush away loosened grease. The filter is then

dried in a stream of compressed air, and dipped in oil specified by the filter manufacturer.

Welding Electrodes

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has announced additions to its arc welding electrode line known as A-C Nickel Manganese, A-C Mo Mang Manganese, X2, and X3 electrodes. The A-C Nickel Manganese and the A-C Mo Mang Manganese are said to have wide application in the mining, cement, and railroad industries for repair and building up of worn equipment. Characteristics of the weld deposit allow it to work-harden to 550 Brinell.

Hard surfacing electrodes X2 and X3 are used to protect parts subject to extensive wear, the X2 for severe abrasion and mild impact and the X3 for severe impact and mild abrasion.

The two manganese electrodes are available in assorted sizes, both bare and coated, the coating being a combination suitable for both a.-c. and d.-c. welders. The two X type electrodes are available in various sizes with combination coating only.

Colored Wire Rope

AMERICAN CHAIN & CABLE Co., Bridgeport, Conn., has brought out a wire rope that is entirely covered with a green-colored lubricant for distribution by its two wire rope divisions, the American Cable and the Hazard Wire Rope divisions. Only the highest grade rope (preformed of improved plow steel) will be so lubricated. The non-preformed ropes made of improved plow steel will continue to be identified by a single green strand.

Welded Buckets

PETTIBONE MULLIKEN CORPORATION, Chicago, Ill., is planning to bring out after the war its Big 4 line of welded dippers and buckets shown in the illustration. For the past few years, the company has been producing welded dippers, mainly for the armed services, in sizes down to ¾-cu. yd.



Four types of welded buckets and dippers

capacity. Interchangeable teeth are available on ½- and ¾-cu. yd. sizes of all buckets except the clamshell.

Truck Mixer Improvements

THE JAEGER MACHINE Co., Columbus, Ohio, has made several improvements in transmission, drum mounting and charging hoppers, and has eliminated overhead water tanks and completely enclosed the front-end in its line of Hi-Dump models.

To increase charging and discharging speed, the drum opening has



Stream-lined mixer truck designed for faster charging and discharging

been enlarged and the charging hopper equipped with a large discharge gate which opens with one quick half-turn of a control wheel without the necessity of moving the hopper itself. As the hopper is always sealed to the drum, heavy-pressure metal seals have been replaced by light-pressure synthetic rubber rings which are said to require less frequent replacement.

Permanent alignment between transmission and drum has been provided by mounting the drive pinion and front drum trunnion bearing on the same heavy support. The drum gear is of internal type driven from the center.

In the new design, the water tank is placed down on the main frame resulting in a lower center of gravity eliminating heavy surging of the water. The metering intake through which the water is withdrawn is locked in any set position by a worm and is connected to a standard Jaeger pump of large capacity. Two water bells spray the water to both ends of the drum.

Grinding Mill Linings

ALLIS-CHALMERS MANUFACTURING Co., Milwaukee, Wis., has announced its new A-C Lorain liner which consists of lifters and liner plates in two separate units. It is adaptable to mills which can be lined with standard cast liners, and it is fabricated from standard flats and shapes of high carbon rolled steel. The principle of separate lifter and liner plate construction permits worn lifters to be reversed for additional wear before replacement.

Haulage



Haul from shovels on left to plant over one-way ramp, on right, is 0.9 mile round-trip

Move Million Tons—Quarry to Plant

Five semi-trailer trucks haul 17-ton loads to supply Krause plant of Columbia Quarry Co., at average rate of 375 t.p.h.

FROM HORSE-DRAWN WAGONS in 1906 to large capacity semi-trailer trucks in 1945 represents 40 years of progress in quarry transportation at the Krause, Ill., crushed limestone plant of the Columbia Quarry Co., St. Louis, Mo.

Over that period of time the quarry has been developed to a half mile in length, roughly half that width, and many millions of tons of limestone have been hauled to the plant for processing into railroad ballast, agricultural limestone and commercial aggregates. Quarry transportation has had to be stepped up progressively over the years to keep pace with a steadily growing volume of production that now averages well over a million tons annually.

Standing on the bluff overlooking the quarry floor 70 ft. below, it is a far cry from the pre-mechanization days of the early 1900's to watch 17-

By BROR NORDBERG

ton loads of stone being hauled on rubber tires to the plant almost without a hitch. From the time a truck is spotted at the working face, it is on its way to the plant fully loaded in just two or three minutes.

Up until 1938, when three trains, each with an 8-ton gasoline locomotive drawing five 5-cu. yd. side-dump cars, were operated, it would have stretched the imagination to visualize that five medium-weight trucks with semi-trailers could handle the output of two steam shovels and deliver an average of 375 t.p.h. of stone to the crushing plant. That figure represents an increase of 100 t.p.h. over the rate with five smaller semi-trailer trucks which were in service until 1944 and a considerably greater

tonnage over that hauled prior to 1938.

The quarry at Krause is located in the limestone bluffs paralleling the Mississippi river near Columbia, Ill. It is characterized by stratifications of various thicknesses. Underlying an overburden of topsoil ranging from nothing up to 25-ft. thickness there is a layer of "top rock," sometimes as thick as 55 ft., which is quarried and removed as a separate operation to uncover a 70-ft. face of high grade limestone. Top rock, as it is called, has different physical and chemical characteristics than the main rock ledge. It must be drilled, blasted, excavated and hauled for sale to secondary markets or for disposal.

The quarry floor presents an attractive picture. It is practically horizontal and has a smooth, clean-cut appearance by virtue of following a natural parting between ledges of stone, in its development. There is a very slight slope in one direction which facilitates drainage. Some 40 ft. of high grade stone remains below for future development. Having taken advantage of a parting plane in establishment of a permanent quarry floor at a favorable level with respect to the primary crusher has facilitated the program of cleanup so important to tire maintenance in the operation of truck equipment.

Bring Down 90,000 Tons Per Blast

General practice is to bring down 90,000 tons of stone per primary blast of 40 holes. Blast holes are 8-in. diameter spaced 17 ft. apart with a burden of 23 ft., drilled to the full height of face. Seven-inch dynamite is standard. On good operating days, with two 8-hr. shifts, 5000 to 6000



Truck spotter watching loading of semi-trailer must give "all clear" signal that tires will clear spillage before truck may proceed to plant



Clean quarry floor pays dividends in low equipment and tire maintenance

tons of stone will be put through the plant, cleaning up an entire shot in 15 days. Three blast hole drills are hard put to it to keep up, and two additional machines are required on the top rock.

It was in 1938 that the changeover from track haulage to semi-trailer trucks was made, to eliminate some of the costly delays and maintenance incident to the re-laying of track in extending the workings into the face and after blasting, damage to the track from blasting and plant operating interruptions caused by wrecks. With the help of a bulldozer, stone can now be loaded into trucks an hour after a big primary blast.

Five lightweight trucks with Easton RP-10 side-dump semi-trailers handled the transportation of stone from 1938 to 1944, with the plant producing an average of 275 t.p.h. The average load was 13 tons. It was a relatively simple matter to adjust the existing track roadway to truck haulage. The one-way ramp from the quarry floor level to the primary crusher extends several hundred feet in length with a maximum grade of two percent.

Increase Stone Haulage Capacity

More recently there came a need for greater transportation capacity. In 1943, a No. 21N Allis-Chalmers gyratory crusher was installed to replace a No. 18 primary, materially increasing the tonnage available to the plant as well as the size stone that could be handled without bridging in the crusher. Capacity of the screening plant was proportionately stepped up, through more efficient re-arrangement of equipment and revisions to the flowsheet, to the point where it exceeded the ability to deliver stone from the quarry.

A new fleet of truck units, consisting of five KR-11 International gasoline-powered chasses and TR-13 Easton semi-trailers, hauling 17 tons, went into service July 5, 1944, and has hauled 1,256,500 tons of stone in a year of service. Incidentally, truck and trailer maintenance has been practically zero to date.

Excavating and loading at the working face is done by a 3½-cu. yd. 95 C Bucyrus-Erie steam shovel and a 2½-cu. yd. 73-R Osgood steam shovel, both of which are on traction wheels. Both machines have seen many years of service and neither, of course, is full revolving.

Under ideal weather conditions, and when there is good stone breakage with little difficulty caused by stone hanging up in the primary crusher, there generally will be a truck at each shovel, a loaded truck enroute to the crusher, one dumping and the fifth returning for another load. Delays at the shovels are becoming less frequent as progress is being made in removing overburden and top rock far back of the face, to minimize contamination.

Production has averaged 375 t.p.h. over a year, with a peak of 421 t.p.h. for a day's operations under extremely favorable conditions. This is mentioned merely to emphasize the potentialities, for ideal conditions are rare in any quarry operation,



"Red" Heise, superintendent

particularly when pushing for maximum production.

Larger Units Operate Same Time Cycle

It is of interest that, in negotiating the 0.9 mile round trip, the larger trailer units accomplish the trip in the same time the smaller units required. Loading time at the shovels is about one-half minute longer for the bigger semi-trailers. It is also of interest that the larger trucks, hauling four more tons of stone per load, consume two gallons of gasoline per hour as compared to one and one-half gallons with the smaller haulage units.

In a typical cycle, assuming that each truck's tonnage is restricted to 75 t.p.h. by normal delays at the primary crusher and at the shovels, 4.4 trips are made. Loading time



Dumping 17 tons of stone into primary crusher by pneumatic hoist with rail for pivot. Note cleanup man on left



Line-up of truck fleet. Note shovel excavating top rock on second level

averages two minutes at the bigger shovel and three minutes at the other, dumping time is one-half to one minute and the balance, of 13.6 minutes, is driving time. Driving speeds are 15 to 20 m.p.h. loaded and 20 to 25 m.p.h. on the return trip.

Very little change was required at the primary crusher to accommodate the larger containers. A larger capacity Curtis pneumatic hoist was necessary. One of the accompanying photographs illustrates the dumping principle. A hook-cable arrangement is engaged to the container on the far side of the crusher, the hoist is actuated to raise the far side of the container and the near side is pivoted as shown.

The crusher attendant operates the hoist from a safety station where he can observe the flow of stone into the crusher. Thus, he can regulate the rate of dumping and instantly hold back when it is apparent that a piece of stone will hang up and necessitate clearing by use of an overhead stone hook. Inside length of the containers is 15 ft., which affords even distribution in feeding this crusher, which has a 42-in. opening.

Clean Roadways Cut Tire Maintenance

From the standpoint of maintenance, particular attention is paid to the prevention of tire cuts by having a thorough cleanup throughout, at the shovels and the crusher and on the roadways. It is the responsibility of truck spotters at the shovels and the crusher to keep the roadways clean. Trucks are started to rolling only when these workers give the all clear signal. The bulldozer is an effective machine on cleanup of roadways at the shovels and a truck-hauled drag keeps the roadways in shape. Tires are 1100 x 20, 12-ply on the front wheels, and 1300 x 24, 16-ply heavy-duty on the semi-trailers.

To minimize breakdowns, each truck unit is checked over completely and serviced in the plant garage every weekend. There are five mechanics at the plant. The garage has

drain pits, overhead hoists and equipment to perform any ordinary repair work including conventional overhauls.

The Krause plant produced one and one-quarter million tons of crushed stone in 1944, on two 9-hr. shifts for much of the operating year, and is operating on a comparable schedule thus far in 1945 on two 8-hr. shifts. More efficient quarry operation, directed toward keeping the semi-trailers moving under full load is responsible, in no small part, for the increase in production.

Operations in the quarry will be further speeded up when four large earth-moving units of equipment go into service on stripping and top rock removal. Two LeTourneau Tournapulls with 14-cu. yd. Carryalls will dispose of the topsoil and two additional machines hauling 12-cu. yd. rock wagons will handle the top rock.

The plant itself is modern throughout and boasts of one of the crushed stone industry's finest Diesel-electric power-generating plants with an installed capacity of 2425 hp. Past articles in *Rock Products* have described various phases of the plant operation. The most recent one, entitled "Agstone Is Big Business," in the April, 1945, issue, discusses the agricultural limestone operations at this plant and at other operations of the company at Valmeyer and Prairie du Rocher, Ill. A fourth plant, at Elsberry, Mo., has just gone into production.

E. J. KRAUSE is president of the Columbia Quarry Co.; W. E. Schmidt is vice-president and treasurer; H. C. Krause is vice-president of sales; A. J. Elliott is secretary and assistant treasurer; and C. H. Krause, II, is purchasing agent. E. A. "Red" Heise is superintendent of the Krause plant and one of the most safety-minded operating executives in the business. He has literally grown up in the plant and served the company for many years as one of the outstanding safety directors in the industry before he assumed the superintendency in 1938.

Cement Postwar Market Is Analyzed

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA estimate that there is an annual \$92,100,000 market, based on 1940 prices, for cement for the three-year highway program for which \$1,000,000,000 is expected to be spent each year on a 50-50 basis by the State and Federal governments. Other postwar projects expected to use huge amounts of cement include a \$2,600,000,000 flood-control program and a \$2,000,000,000 waterways improvement program. In the residential field alone, it is estimated that 12,770,000 bbls. of portland cement will be needed for each 1,000,000 new small homes that are to be erected. Enlarged markets for cements are expected from increasing use of concrete floors and roofs. A new development is the use of a topping course of white portland cement concrete in concrete floors to improve illumination. Larger cement exports are expected this year and this market is expected to expand as European mills are largely destroyed or handicapped for shipping space. Some cement may even be shipped from this country to Europe.

Future of Cement

CRIS DOBBINS, vice-president and general manager of Ideal Cement Co., Denver, Colo., recently addressed the Investment Bankers Association in Denver on the future of the cement industry. Expressing optimism, he said, "It appears almost a certainty that there will be a tremendous program of construction of all kinds which will certainly use vast quantities of cement." Referring to new uses of cement, Mr. Dobbins said, "It might be stated without exaggeration that the link of the past with the future will be concrete. The cement industry, without being conscious of it, is perhaps a pioneer in the field of plastics, for concrete is nothing more nor less than a plastic on a massive scale." He pointed to some of the outstanding postwar programs in Colorado and Texas, involving many millions of dollars for bridges, highways and ship channel improvements, etc., as indications of the very large market which will be opened up for cement in territories served by the company's plants.

Manchurian Cement

JAPAN is reported to have erected several cement plants in Manchuria as a war measure. Most of these plants, however, are small and scattered and do not offer very big military targets. The Mitsui, Mitsubishi, and Noguchi interests have financed most of these projects. They have received government aid in the form of hidden subsidies.

Capacity of Vibrating Screens

**Factors involved in estimating
capacity of vibrating screens**

By **NATHAN C. ROCKWOOD**

IN THE JUNE instalment of this series we answered a producer's question as to whether or not there is a generally recognized method or formula for estimating vibrating screen capacities by saying "no." Also discussed were some of the many reasons why there can be no such formula; why the factor of experience plays such an important part in estimating screen capacities.

There is a formula in existence. It was published in 1936 by the Smith Engineering Works in one of its catalogs. We recently asked D. D. BARNES, executive vice-president and sales manager of the company, something about this formula; he replied that the tables of factors given were "found not to be accurate under all conditions, so we discontinued publication. In view of the fact that it requires certain qualifications, we would not advise you to use it. We use it ourselves, with these qualifications, but find it is not suitable for general use."

What Mr. Barnes says merely emphasizes the points brought out in our previous article. Nevertheless, we are going to give the substance of the Smith Engineering Works' formula, because, while it may not be generally applied by the novice, it will bring to light some of the most important factors and considerations

in connection with the operating performance of any vibrating screen. Moreover, let the reader bear in mind that this formula was probably developed for coarser material than sand, although the same kind of factors would have to be taken into account for fine screening as for coarse screening.

With this preliminary warning we give the formula and will discuss the factors its use involves:

$$\begin{aligned} (1) \text{ CP} &= \text{Area} \times (A \times B \times C \times D \\ &\quad \times E \times F) \\ (2) \text{ TC} &= \text{CP} + \text{Oversize} \\ &\quad \text{TC} - \text{Oversize} \\ (3) \text{ Area} &= \frac{\text{CP} - \text{Oversize}}{A \times B \times C \times D \times E \times F} \end{aligned}$$

In the formulas, CP is Capacity in tons per hour passing the screen cloth. TC is termed Total Capacity, which is obviously both the material passing through, plus the oversize; in other words it is the limit of feed to the screen. The factors A, B, C, D, E and F, which are all multiplied together in the divisor in formula (3), are explained in what follows. In the original publication, tables of numerical values are assigned to these factors; but, since it is not intended that the formula be used by

the present reader, the tables are omitted here.

Factors to Consider

The first thing to note about the formula is that the larger all the factors are, A, B, C, etc., the smaller the screen area required. In other words the numbers assigned to each factor affect the screen area inversely by increasing the divisor in the ratio expressed by the formula (3); or it is obvious from formula (1) that with a fixed area of screen surface the tonnage of material that will pass through increases directly with an increase in each of the six factors A, B, etc.

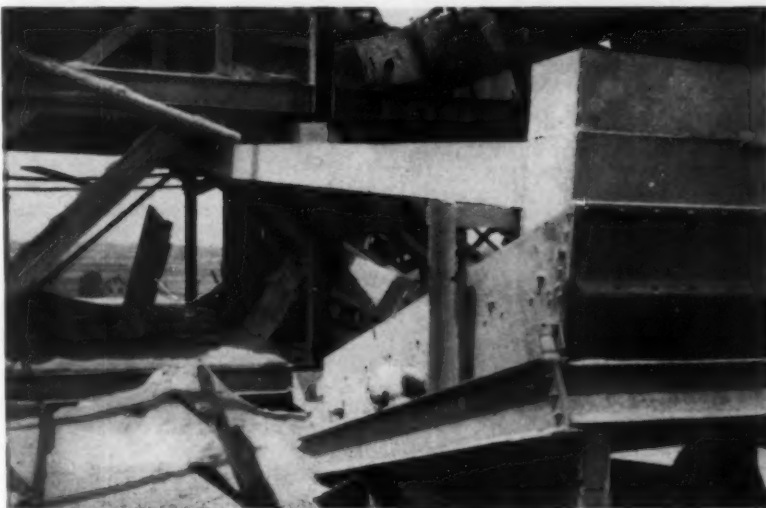
Factor A

Factor A depends on the size of the square-mesh opening and on the character of the material to be screened. Its value is based on "capacity in tons per hour passing through one square foot of screen cloth at 95 percent efficiency with 25 percent oversize in the feed." By efficiency is meant the definition given in Rock Products, February, 1945, p. 104, an article of this series:

$$E = \frac{10,000 U}{u F}$$

where U = tonnage passing through; F is tonnage of whole feed; u is percentage of undersize in the oversize. In this case, of course, it means that the screen removes 95 percent of the 75 percent undersize in the feed; or there is 5 percent of the 75 percent undersize left in the oversize.

Factor A also takes into account the character of the material screened, gravel, crushed stone and coal being assigned diminishing values in that order; taken into consideration are probably shape of particle and weight per cu. ft., since the real measure of screen capacity is the volume of material passed rather than weight. Factor A also takes into account the size of the particles to be screened, or the size of the screen mesh. Obviously, the larger the mesh the larger is the percentage of openings per sq. ft. of screen surface. Thus with square mesh made of medium heavy wire the percentage of open area for 1/2-in. mesh is 54.5 percent, and for 3/8-in., 40.2 percent; which is another way of saying that the finer the mesh, the larger the screen area re-



Minus 1/4-in. material from trommel screen in background is laundered to vibrating screen, foreground, where oversize is wasted and fines enter sand tank to produce filter sand. Keystone Gravel Co., Dayton, Ohio

quired for the same tonnage of throughs.

Factor A in the Smith Engineering Works' formula, for gravel, varies from 0.72 for $\frac{1}{8}$ -in. mesh to 1.68 for $\frac{1}{2}$ -in. (Factors are given $\frac{1}{8}$ -in. to 5-in.) For crushed stone the corresponding factors are 0.56 and 1.40. This means it is about 50 percent easier to screen rounded gravel or sand than it is to screen angular fragments of crushed stone, probably taking into consideration also the difference in weights per cu. ft. It is more than twice as difficult to screen $\frac{1}{8}$ -in. material than it is to screen $\frac{1}{2}$ -in.

Factor B

Factor B depends on the percentage of oversize in the feed. This factor decreases as the percentage of oversize increases. For example, considering now only $\frac{1}{8}$ -in. gravel or sand, Factor B is 1.05 for 10 percent oversize and 0.90 for 50 percent oversize; with 90 percent oversize Factor B is 0.55. Remember these figures are based on an assumed screen efficiency of 95 percent. They mean that a screen operates best when scalping a small percentage of oversize from the throughs; or the screen has to do more work in removing a large percentage of oversize than in passing a large percentage of throughs. It is about twice as difficult to take out 90 percent oversize as it is to take out 10 percent.

The reason Factor B decreases with an increase in the percentage of oversize is the difference in kind of screening operation, as explained in the article in this series in the June issue. The more oversize the more blinding of the screen openings, at least temporarily. Moreover, where one has a large percentage of oversize there is apt to be a considerable percentage too near the size of the mesh opening for effective screening. Such a problem could probably be met most effectively by making the separation on two screens with different sized meshes, or possibly with a two-deck screen, although no two-deck screen has efficiency equal to two separate screens.

Factor C

Factor C in the formula is a correction for the efficiency desired. The rest of the factors are based on the 95 percent efficiency first named in Factor A; consequently Factor C for 95 percent is 1.0. For 60 percent efficiency it is 2.10. Naturally, more tonnage will be passed through the screen, the more undersize there is allowed in the oversize because it will permit proportionately more feed. As readers of the article in the June issue may remember, there are some kinds of screening operation where high efficiencies are neither necessary nor desired.

There are numerous examples of screening where a screen will pass



Arrangement of horizontal screens for wet screening, Blue Diamond Corporation, Los Angeles, Calif.

more of a certain size than is wanted. For instance, there is, or was, an Iowa operation making concrete sand, the raw material for which had too large a percentage of coarse particles. A 4- x 12-ft. two-deck positive-throw type vibrating screen was used with $\frac{3}{8}$ -in. square mesh on the top deck, and 8 ft. of 10-mesh and 4 ft. of $\frac{1}{4}$ -in. by $\frac{1}{2}$ -in. rectangular mesh on the lower deck. A divider plate was arranged to be moved up or down the $\frac{1}{4}$ x $\frac{1}{2}$ wire-cloth section, so as to block off as much as 3 of the 4 ft., if desired. This scheme, of course, was to save all the minus 10-mesh and as much of the coarser material passing the $\frac{1}{4}$ x $\frac{1}{2}$ openings as necessary for a properly graded concrete sand.

Factor D

Factor D is one of the most important in screening sand or other fine material. It is the percentage of feed material less in diameter than one-half the size of the screen opening it is proposed to use. So it is very necessary to have an accurate average sieve test of the material to be screened. Since one cannot change the character of the material to be screened, he must be prepared to change the mesh of the screen to get the best over-all results. This may mean you can get results much nearer what you want by making a separation on a 10- or 12-mesh screen than on a 16-mesh, if a large percentage of the particles are around say 0.03-in. diameter. Theoretically, these should go through an ordinary 16-mesh screen with 0.04-in. openings, but they would go through an 8-mesh of heavier wire mesh with approximately a 0.07-in. opening, much more readily; and if the efficiency were not too good, too much of the plus 16-mesh would not be passed, so that the product might be nearer a minus 16-mesh product than one screened

on a 16- or 14-mesh. The shape of the particles would also be a consideration, although it is probably not taken into account in determining the value of Factor D, since it is considered separately in Factor A.

Factor D in the formula given varies from 0.55 where only 10 percent of the feed is less than one-half the size of the mesh opening to 3.0 where 90 percent is less than one-half the mesh size. In other words this factor alone can vary as much as 500 percent. Nothing could make it more obvious that selection of the proper mesh is extremely important in any vibrating screen operation.

Factor E

Factor E is the one which attempts to evaluate the effect of wetness of the material to be screened. This factor is more important in screening sand than gravel, although in either case mere dampness adds greatly to screening difficulty, because you are depending only on vibration and abrasion to shake clinging undersize free. Factor E uses "dry" material as a standard, giving it the value 1. It assumes there is water with the material, or water is sprayed on the screen; and if from 5 to 10 g.p.m. of water is added per cu. yd. per hour of material, this constitutes "wet screening," and the values given for Factor E are then to be used.

Translated into terms that sand and gravel operators will grasp more easily, this means the minimum amount of water required to make a wet-screening operation is $5 \times 60 = 300$ g. per hr. per cu. yd. of material

per hr. This is $\frac{300}{27 \times 7.5}$ or about

$1\frac{1}{2}$ cu. ft. of water to 1 cu. ft. of sand or gravel. That is only a 3 to 2 dilution, in terms used in dredging

sand and gravel; in other words a liquid with 66 percent solids. This is not nearly enough water for best results with sand. The condition of the sand feed when it enters the screen should be comparable to the feed of a hydraulic classifier; it should certainly not be over 33 percent solids, on a volume basis.

Here let it be interpolated that sand and gravel producers have difficulty applying mining data to their own operations. In mining literature percentage of solids to liquid is given in terms of absolute-volume weights of the solids. (The weight of a cubic foot of solid is its specific gravity multiplied by the weight of a cubic foot of water.) A feed dilution of 3 to 1, as mention by R. J. ROBERTS in the article in our June issue, means 3 times as much water by weight as the absolute-volume weight of the solids in the pulp. If the pulp is sand, this weight is about 165 lbs. per cu. ft., so $3 \times 165 = 495$ lbs. of water per 165 lbs. of solids, or about 8 cu. ft. of water to 1 cu. ft. (absolute volume) of solids. In sand and gravel dredging operations, sand is considered to be saturated material with the maximum amount of voids (about one-third voids) and in calculating percentage of solids in the dredge delivery is rated at 110 lbs. per cu. ft. So 495 lbs. (8 cu. ft.) of water per 110 lbs. of sand would mean better than 4 to 1 dilution by weight or something less than 25 percent solids, as the terms are used in dredging and processing commercial sands. This difference must be kept in mind in using Shaw's "Fundamental Principles of Sand Settling" because he uses the mining data. It is much simpler and more direct to use volumes in the calculations for hydraulic classification of commercial sand, as well as in screening, taking sand at 110 lbs. per cu. ft. and water of course at 62½ lbs. On this basis a 3:1 dilution by weight means nearer a 6:1 dilution by volume, which is about 17 percent solids, or about the normal figure for a dredging operation (see article in this series, November, 1944, pp. 48-50, incl.).

To get back "on the beam," Factor E begins with a figure of 1.25 for ½-in. screen opening, rises to 3.50 for ¾- and 1-in., and decreases to 1.25 again for a 1-in. opening. This means, apparently, that it is easier to wet screen material around ¾-in. than it is to screen either finer material or coarser material, using presumably the same amount of water in each case. The reason for this is not readily apparent, and may involve other things such as the speed and amplitude of the screen vibrations as well as the characteristics of size and shape of material. It certainly should involve consideration of the manner in which the water is ap-

plied. With fine mesh screens, spraying the water from above might easily help blind the screen rather than help the particles through. The lower factors for the coarse sizes evidently mean that these are almost as readily screened without water as with it.

Those who read and absorbed the remarks of R. J. Roberts in the June issue must be convinced that it is better to add the water to the material before it is fed to the screen, than it is to spray water on the material on the screen. And he also made it clear that the average sand and gravel operator, unless he happens to get his raw material by hydraulic dredging, does not use nearly enough water to do a satisfactory job of screening sand.

Factor F

Factor F is important only when using a multiple-deck screen. For a single deck screen its value is 1. For the second deck it is 0.90 and for a third deck 0.75. In using a two- or three-deck screen, the screen area required or the size of the screen is figured on the requirements of the lowest deck, so that the top deck will generally be larger than would ordinarily be required for a single-deck screen.

Screen experts tell us there are often occasions where a 2-deck screen is desirable, especially where there is a preponderance of oversize and it is desired to save wear and tear on a finer mesh screen below. However, they also say that a 3-deck screen is seldom justified except there be unavoidable lack of headroom for two or more screens. In any event, if the operator wishes to do the most efficient or most effective job of screening, it is much better to do each operation on a single-deck screen. Speed and amplitude of vibration should be different for different sizes of screen mesh; in fine screening, for example, higher speeds and smaller amplitudes are best; so in a multiple-deck screen, with widely different sizes of screen mesh, all conditions can not be met with any selected single speed or amplitude of vibration.

Oregon Silica Industry

SILICA PRODUCTS, OREGON, LTD., Eugene, Ore., is operating under lease from Defense Plant Corporation a modern silica processing plant costing about \$175,000. The foundry sand produced is said to be similar to New Jersey sand. It is planned to purchase the plant from the government after the war, making other silica products, including glass sand, roofing granules, sand paper, and ground silica fillers, etc. At present the raw material is excavated with a dragline and loaded into trucks for a two-mile haul to the washing plant. After

washing operations, a bucket elevator carries the sand to a hopper feeding a belt conveyor supported on a timber trestle from which it is dropped to stockpiles below for dewatering. Sand from the stockpiles is transported to a steam dryer, the product being elevated to a battery of screens for sizing and storage in bins for shipment to the foundries.

Dust Analysis

BUREAU OF MINES has proposed a new "filter-paper" method for obtaining samples of air for dust analysis in health surveys. The new device recovers dust from the air by drawing the atmosphere, with a hand-operated pump, through a special filter-paper instead of through liquid, as in the "impinger" method used in obtaining dust samples for scientific study, according to a Bureau bulletin which describes both techniques and compares their effectiveness.

With the "filter-paper" method dust is collected from the air by filtration through pieces of special paper and gathers on the paper. Before it can be counted it must be removed, and this is accomplished by placing the filter papers in a dust-free liquid, such as ethyl alcohol, and shaking them vigorously. The dust leaves the paper readily. Lintless, high-wet-strength, hardened filter paper is used for fine precipitates. Determinations were made by the Bureau on impinger and filter-paper samples of silica dust and coal dust and the results indicate clearly that the filter paper method has promise of securing results comparable to those of the impinger.

Being dry, the filter paper sample can be kept indefinitely before the dust particles are counted, but the impinger samples in water cannot be stored easily because of the danger of bacterial growth or solution of the dust, commented Carlton E. Brown, author of the report, who is a chemist in the Gas and Dust Section of the Bureau's Health Division.

The author credits three other Bureau scientists, W. P. Yant, H. H. Schrenk, and R. L. Beatty, with the first attempt (in 1936) to develop a filter-paper method of collecting dust samples. The samples were to be collected on paper which was to be dissolved in a solution. However, their research work was discontinued because of difficulties encountered in finding a suitable solvent for the filter paper.

A copy of the publication, Report of Investigations 3788, "Filter-Paper Method for Obtaining Dust Concentration Results Comparable to Impinger Results," may be obtained free by writing the Bureau of Mines, Department of the Interior, Washington 25, D. C.

Conserve Water in Sand Recovery

John B. Lagarde, Anniston, Alabama, uses both dry and wet recovery systems in his extensive sand and gravel plant operations

By H. E. SWANSON

EXPLOITATION of a sand and gravel deposit requiring an unusually large volume of washing water in a region where water is scarce has resulted in a unique layout and water recovery system at the plant of John B. Lagarde, Anniston, Ala. The pit is located higher than the Anniston city water tank which prohibits the utilization of water from this source. To combat the scarcity of water, a large clarifier or settling tank was constructed, which reclaims water after washing operations.

Built by the company, the concrete tank is 70 ft. in diameter, 8 ft. deep in the center and 6 ft. deep on the outside, and has a 35-ft. revolving

Stockpiling sand with slackline cableway system

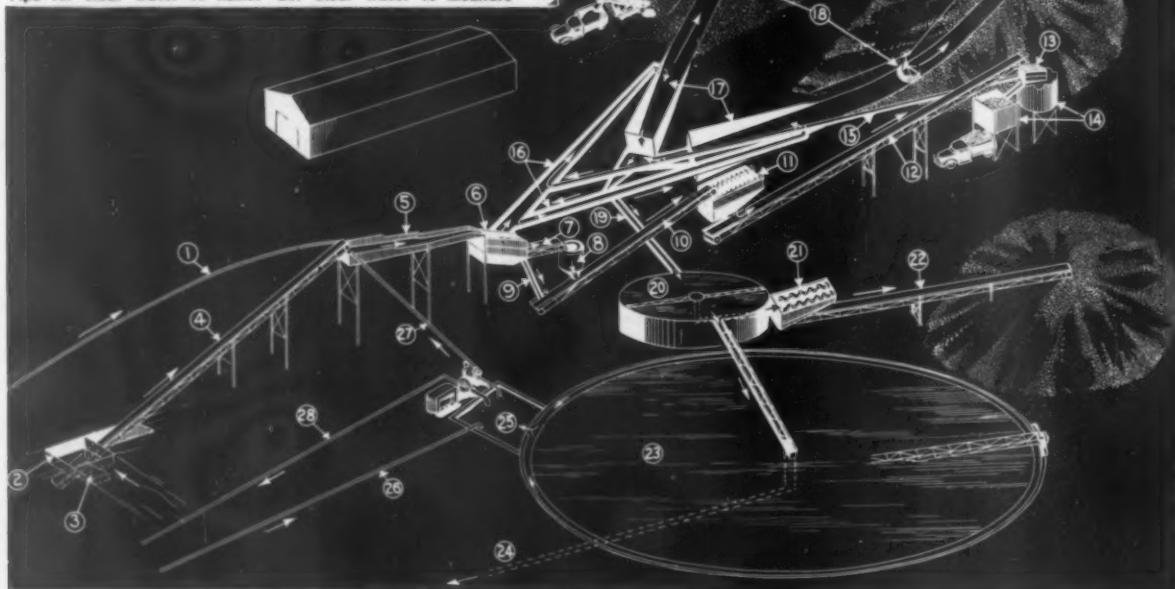


arm which drags clay and silt to the center for disposal. Clear water is caught in a circumferential overflow which takes it to a 20,000 gal. sump located alongside the tank. Water is pumped from this sump to the various operations in the plant and pit. Clay and silt dragged to the center of the clarifier is sent with a small amount of water through a 6-in. pipe to a ditch which carries it to a waste disposal area where the foreign mat-

ter settles and the clear water is recovered for re-use.

The nature of the deposit, which is composed of about 55 percent sand, 20 percent gravel, and 25 percent clay and silt, requires a large amount of washing. The strata are V-shaped and about a 50-acre deposit outcrops in this region. Test holes have been drilled to find the bottom of the deposit, but a 400-ft. depth failed to reach the limit.

Showing perspective layout of sand and gravel screening and washing plant. 1. Pipe carrying material from pit to plant. 2. Hopper which receives dry material from pit. 3. Feeder under hopper. 4. Belt conveyor. 5. Flume carrying material to screens. 6. Screens. 7. Picker belt. 8. Gyratory crusher. 9. Chute. 10. Belt conveyor. 11. Log washer. 12. Belt conveyor. 13. Screens. 14. Bins. 15. Flume returning fines to settling tanks. 16. Flumes carrying fines from first set of screens to settling tanks. 17. Settling tanks. 18. Slackline cableway for stockpiling sand. 19. Flume carrying fines to classifier. 20. Classifier. 21. Screws. 22. Belt conveyor. 23. Clarifier. 24. Pipe to waste recovery pond. 25. Clear water sump. 26. Pipe carrying clear water from waste disposal area to sump. 27. Pipe for clear water to flume. 28. Clear water to monitors



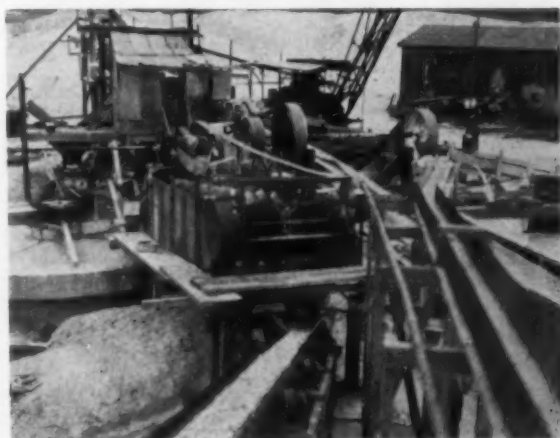
CLASSIFY SAND AND CLARIFY WATER



Looking down into sand and gravel pit, showing pump house and sump



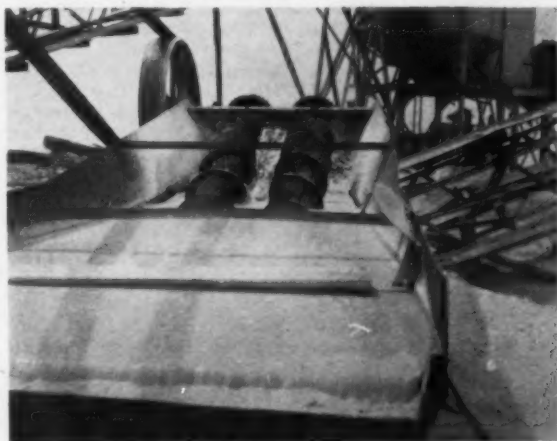
Slackline cableway bucket drawing sand from tank to stockpile; sand screws take sand from classifier to belt conveyor for stockpiling; gravel bins to the right



Discharge end of log washer, center; classifier at left; flume to right carries fines from screens above bins to settling tanks; conveyor to the left transports gravel to bins; conveyor in the center moves fines from classifier to stockpile; classifier to the right



Flume to extreme left carries fines from screens above bins to settling tanks; belt conveyor to the left transports gravel to bins; conveyor in the center moves fines from classifier to stockpile; classifier to the right



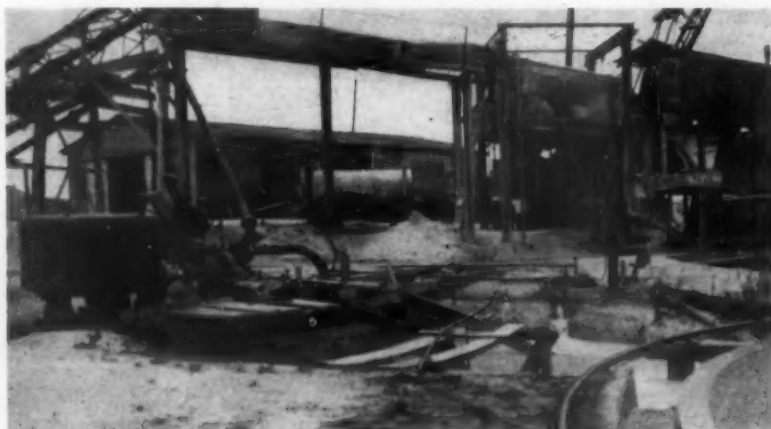
Dewatering screw for fines recovered by classifier



Clarifier showing sweep beam which drags clay and silt to center where it is drawn off and wasted



John B. Lagarde, owner



Clear water sump fed by clarifier from which water is pumped to plant and pit



J. N. Gann, superintendent

Recovery of sand and gravel from the pit is made by both wet and dry methods, the dry method serving more or less as an auxiliary. An 8-in. monitor, with a Fairbanks-Morse 10-in. suction and 8-in. discharge pump, washes material into a sump in the pit. The pump is powered by a VD18 International Diesel motor. Water is pumped to the monitor at 2300 g.p.m., 50 p.s.i. pressure. Material is drawn from the sump to the plant through an 8-in. pipe by a Georgia Iron Works 8-in. pump, powered by a No. 909 Buda Diesel motor. Material entering the sump creates an eddy at the pump which is dissipated by playing a 150 g.p.m. stream of water into the center of the sump through a 2½-in. fire hose.

Plant Operation

When the pump is being moved from one location to another or when the wet recovery system is not in operation, material is reclaimed by an 8-cu. yd. Continental scraper pulled by a D7 Caterpillar Diesel tractor for delivery to a hopper at the plant. A Jeffrey vibrating feeder draws material from the hopper to

a 24-in. belt conveyor, 60-ft. centers, which discharges into a flume box that also receives material from the pit by the wet recovery method. When the dry method of recovery is in operation, washing water is added at the flume by an auxiliary 6-in. Fairbanks-Morse pump which supplies 1500 g.p.m. at the feed end. The flume, which is 25 ft. long, 2 ft. wide, and 2½ ft. deep, and fabricated from heavy boiler plate, discharges over a 4- x 10-ft. double-deck Seco vibrating screen, which has ¾- and 1¼-in. square openings in the top deck and either ½- x 1-in. or 8-mesh in the lower deck, depending on the type of sand to be produced. The ½-in. screen is for concrete sand and the finer mesh for masonry sand. Above the screen are two 2-in. pipes, perforated to spray wash water over the material as it is being screened. Water is supplied by a 2½-in. suction and 2-in. discharge 10-hp. Fairbanks-Morse combined pump and motor unit. Water is sent through a 3-in. pipe to the two pipes above the screens.

Gravel

Oversize gravel, rejected on the top screen, drops to an 18-in. picker belt, 6-ft. centers, where clay balls are removed. The belt discharges to an 8-in. Superior McCully gyratory crusher which reduces the gravel to 1½-in. top size. Material passing the top deck is chuted to a 20-in. belt conveyor, 60-ft. centers, which also receives the gravel from the crusher. Sand passing the bottom screen is flumed to two settling tanks. The sand recovery process will be described later in this article.

Gravel is moved by the belt conveyor to an 18-in. double screw log washer where small clay balls are removed. The washer is constructed of steel plate, and is 18 ft. long, 6 ft. wide, and 4 ft. deep. It is equipped with SKF spherical roller bearings throughout. Washed gravel discharges to an 18-in. belt conveyor,

60-ft. centers, which transports it to a 2- x 4-ft. double-deck vibrating screen. Water added to the log washer and to the screen is received from the same pump which supplies water to the primary screen. About 250 g.p.m. is supplied for the three operations.

The double-deck screen, located above two storage bins, has ¾-in. square openings in the upper deck and 8-mesh in the lower deck. Oversize (concrete gravel) goes to a 30-cu. yd. steel bin, pea gravel retained on the lower deck goes to a 15-cu. yd. steel bin, and material passing the lower deck is flumed back to the sand processing operations. Both of the bins have bottom-discharge gates for truck loading.

Sand Processing

Sand which passes the lower deck of the primary screen is sent by flume to either of two concrete settling tanks, depending on the type of sand to be produced. A gate in the flume diverts the flow to the proper tank. The tanks are 30 ft. long, 7 ft. wide, and 5 ft. deep at the back end, sloping up from the middle of the tank to the recovery end at about a 20-deg. angle. The flow enters the side of the tank about 5 ft. from the front end, thus the sand settles at the front end and the overflow discharges at the back end. Concrete sand is reclaimed by a ¾-cu. yd. Crescent scraper bucket, drawn by an American hoist, powered by a 50-hp. Caterpillar Diesel motor. This slackline cable-operated bucket draws the sand up to the 90-ft. mast where it is dumped. Mortar sand is reclaimed from the other tank in the same manner. The mast for this stockpile is 80 ft. high. A ¾-cu. yd. Crescent scraper is drawn by a Lambert hoist, also powered by a 50-hp. Caterpillar Diesel motor. This slackline cableway system of recovery is shown in an accompanying illustration.

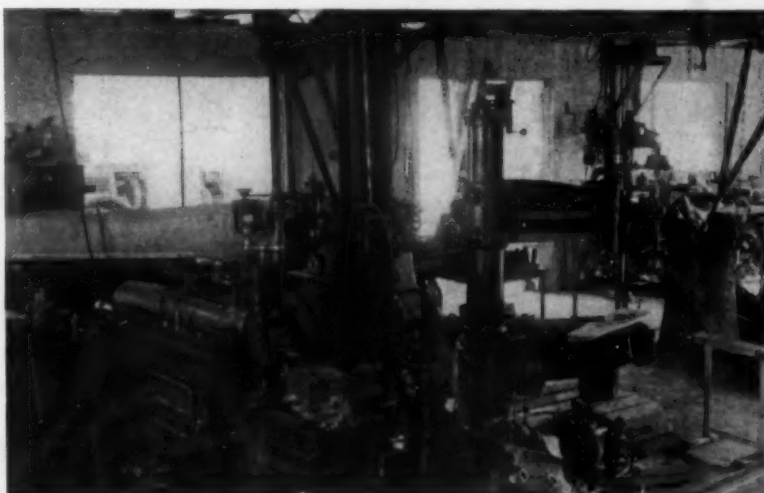
Sand which passes the lower deck of the double deck screen above the gravel silos is sent by flume either to the settling tanks or to the flume which receives the overflow from the tanks. Gates in the flume govern where the flow is sent. Water overflowing the tanks is laundered to a concrete classifier to recover fines. This classifier is 16 ft. in diameter, and 4 ft. deep, with a cone-shaped base. A rotating arm, 15 ft. long, drags the sand to the center of the classifier for discharge through a 6-in. pipe to dewatering screws. The arm was constructed from a 6-in. channel iron and has old road blades for drags. A valve between the classifier and the dewatering screws governs the rate of flow to the screws. Sand flows by gravity from the classifier to a steel box 15 ft. long, 5 ft. deep, 7 ft. wide at the top and 3½ ft. wide at the bottom, which contains two Link-Belt helical screws. The dewatered sand is discharged to a 14-in. belt conveyor, 60-ft. centers, which carries it to a stockpile. This sand, which was wasted prior to the installation of the classifier, is suitable for filler sand or asphalt sand. About 30 to 50 tons is produced per day. Sand is loaded to trucks from the stockpiles by a Haiss loader.

Clarifier

Water in the classifier goes into a 16-in. wide circumferential overflow flume and then is laundered to the clarifier. The arm, or sweep beam on the clarifier, which revolves once in about 3½ min., is powered by a 2-hp. Fairbanks-Morse motor. As shown in an accompanying illustration, the end of the sweep beam is mounted on two 12-in. wheels which are chain-driven by cog wheel on a shaft which in turn is driven by the motor. The wheels ride on an 80-lb. monorail which encircles the clarifier. Mud and clay are carried through a ditch to a waste disposal area, where the clay is settled out and the clear water recovered for re-use. Water overflowing the clarifier goes to the clear-water sump from which it is pumped to the various operations in the plant or to the monitor in the pit.

Water Supply

The total source of water comes from a 400-ft. well which supplies about 60 g.p.m. by means of a 12-stage Fairbanks-Morse deep-well pump having a 5-hp. Fairbanks-Morse motor. The well water is sent to a 30,000 gal. reservoir and is then drawn off as needed to supplement the supply in the clear-water sump. About 250 g.p.m. is recovered from the waste disposal area which is returned to the sump by a 10-hp. Fairbanks-Morse pump. About 4000 g.p.m. is necessary to operate the plant at full capacity. Water from the sump is pumped to the plant and pit by an



General view of well-equipped machine shop

8-in. Fairbanks-Morse pump powered by a 100-hp. International Diesel motor.

Production capacity is about 350 tons per day. Prior to the present installation, erected in 1942, production was around 250 tons per day.

In addition to the sand and gravel plant, this company operates a ready mixed concrete plant and a masonry unit plant. The ready mixed concrete plant was constructed originally in 1937 and enlarged in 1944. Mr. Lagarde started in the block business in 1938, and enlarged this plant in 1941. At the same time that the concrete plant was built, a new office building was also constructed. This building has a ramp on the roof which permits trucks to back up and discharge to the bins of the ready mixed concrete plant. The ramp has a load-bearing capacity of 16 tons. The offices of the company are located on the second floor of the new building while the first floor is composed of wash rooms and locker rooms for the employees.

For proper maintenance of equipment in all three operations, this company has a well equipped machine and repair shop. A machinist, two auto mechanics, one welder, and two helpers are maintained at all times to handle repairs and to construct parts which are difficult to purchase. The shop is equipped with lathes, milling machine, 5-ton traveling crane, planers, power hacksaws, drill press, bench drills, hand drills and grinders, arc welders, and forge. Adjoining the repair shop is a newly constructed building which will be used as a garage. It is equipped with two grease pits, an overhead 5-ton traveling crane, and has steam heat and fluorescent lighting.

John B. Lagarde is the owner of this plant, and J. N. Gann is general superintendent.

Scots Find Market for Waste Stone

WAR has stimulated the demand for housing in Scotland, and to reduce costs and speed up construction, new methods and products are being used. The Scottish Special Housing Association has built some experimental housing at Sight Hill in Edinburgh, using a so-called "no fines" concrete. Fines in the mix are avoided, the sole components being "chips" and cement in the proportion of eight parts to one of cement. Water is used merely to moisten the grout and give it a sticky consistency. The "whin" chips are waste rock consisting of basaltic intrusions in limestone, according to one description. Construction is reinforced monolithic concrete placed continuously in mass, using large mixers at or close to the job site.

Newfoundland Fluorspar

FLUORSPAR PRODUCTION in Newfoundland has increased eightfold from 1941 due to the demand created by the war emergency. Estimates show that the 1944 production will reach the record figure of 95,000 tons.

Fluorspar occurs principally in a 20-sq. mile area near the St. Lawrence Harbor. The veins occur in steeply-dipping fault fissures, some of which are a mile in length. They can be classed into two types, the first being a high-grade with a calcium fluoride content of at least 95 percent, a silica content of one to four percent, with an average width of 5 ft. The second has a calcium fluoride content of about 75 percent, a silica content of 10 to 15 percent, and averages 15 to 20 ft. in thickness.

About 75 percent of production normally goes to Canada and the balance to the United States.

Argentine Cement Industry

By JORGE BOISO*

Big increase in demand for cement expected in post-war period for highway and building construction. Fuel and machinery shortages now handicap industry



Longest kiln in Argentina, 394 ft., is operated at the Parana Plant

MANUFACTURE of portland cement in Argentina by modern methods began in 1919 with the installation of the first plant in Sierras Bayas, Patido de Olavarría, Buenos Aires Province, under the name of Compañía Argentina de Cemento Portland, as a subsidiary of the Lone Star Corporation.

The Sierras Bayas plant had no competition except importations from Europe until 1927 when a second plant was opened in the same district. Later in 1929, two more plants were built in the Cordoba district. In 1935 and 1936, three more plants were constructed, one in Olavarría district and two in Mendoza district. By 1937 there were seven plants in the country owned by five companies with an estimated total capacity of 1,000,000 tons.

It was also about this time that cement consumption increased tremendously as a result of extensive

highway developments, advanced public works and private construction for industry and housing purposes, and a shortage of cement became apparent with demand increasing over production. Companies with a vision started to enlarge existing plants, and four new plants were built; one in the Entre Ríos district, another in Santiago del Estero, a third in Salta, and the fourth in the Buenos Aires district. In 1939, 11 plants were operating, scattered all over the country, with an estimated annual capacity of 2,000,000 metric tons.

Equipment of the Argentine mills is modern and of a good quality, especially the last installations from 1935 onwards. Some plants can be regarded as "model plants," as the Lone Star Paraná mill, the only flotation process in the country.

Most of the plants have their own quarries located immediately behind the plants, with the exception of a

couple which transport the raw material as far as 35 km.; by railroad in one case and by aerial tramway for shorter distances in another case. Only rotary kilns are used.

Normal daily shipment capacity of all the mills is at the rate of 5,000 metric tons (2,930,000 bbls.). With the exception of the Paraná mill which uses the river line for the majority of the shipments, all the others use the railroad and a very little amount is hauled by trucks, especially from the mills situated very near the consumption markets, for domestic use. The technical personnel has been, at least in the beginning of the industry, contracted between foreign specialized engineers and chemists in portland cement. Besides those technical men some of the experts from the original suppliers of equipments during the setting up of the machinery remained with the mills. Gathering the experience of that basic group, local technical men have developed their knowledge. Most of them are university men and from technological schools.

Actually we estimate about 100 technical personnel managing the industry and about 3,000 workmen in the mills. Laboratories have been built in every plant with good equipment and with trained men paying careful attention to the quality, because competition made an exacting market. The investment in the portland cement industry amounts to about \$130,000,000 Argentine currency, that means about \$40,000,000 in U. S. currency.

Wartime Conditions

The main difficulty for the portland cement industry has been the successive reductions in the amount of fuel. Before the war, every plant



Typical limestone quarry in the Province of Buenos Aires, Argentina

NEW MARKETS

in Argentina operated exclusively with fuel oil. There is very little native coal and it was not under work. The normal consumption of fuel oil was 250,000 tons per year. In 1940 there was a small reduction of fuel oil; in 1941 the reduction was 30 percent of the average of supplies; in 1942 and 1943 the amount of reduction was up to 40 percent and in 1944 it was 50 percent. This situation made the industry look for other kinds of fuel.

The Argentine portland cement industry can show to the world's technical men a wide experience in burning different kinds of cereals and ex-pellers in rotary kilns to make portland cement. Kilns are burning pulverized bran, sawdust, oleaginous ex-pellers. One of the mills has burned over 200,000 tons of that kind of fuel. Other plants got coal, burning pulverized fuel. Others burned mixed fuel oil and charcoal. The charcoal price is in relation to its calorimetric value. There is also a plant trying to operate with a gas generator running with wood, because in Argentina there is no natural gas available. All these different kinds of fuel brought up various chemical problems in connection with ash composition and alkalis and its dangerous action on metallic parts. Everything has been studied and solved satisfactorily. In spite of a shortage in fuel oil, the portland cement industry produces the same amount of finished cement of the best quality.

There is also a lack of other materials that before the war were imported, such as parts, fire brick, explosives, cloth sacks, specified steels, welding material, etc.

All these requirements have been replaced by the ability of local workshops and some of them by substitutes, not always so good as the ones we were used to, but enough to operate. Evidently the machinery has suffered and all these provisional replacements and repairs have shortened the life of the equipment.

New Products and Markets for Cement

Notwithstanding the difficulties, the manufacturers of portland cement have started promotion of new products and markets. In 1939 the Argentine Portland Cement Institute was founded, a copy of the P.C.A., and it is working satisfactorily all over the country. It has its own laboratory and a good group of trained engineers. Two good lines have been developed: single concrete highways and pavements and several uses of soil-cement for rural purposes and secondary uses. The two lines opened, in the last two years, new markets for cement.

To close this report of portland cement development in Argentine Republic we think that as soon as the

war restrictions disappear, especially the fuel oil shortage, the consumption in the country will jump over 1,-

500,000 metric tons yearly, because public work planning on every side will demand more cement.

New Vermiculite Plant

By PEARL ANOE

TWO YEARS AGO, from Colorado Springs, Colo., the AlexItE Engineering Co. began to operate its newly purchased manganese and vermiculite mine at Powderhorn, in Gunnison county, Colo. The company has continued to develop and enlarge the mining facilities; it has added additional housing capacity for 20 workers and equipment for bulldozing AlexItE into loading bins.

For Insulation

In the past years this type of expandable mica (vermiculite) known as "AlexItE," has proven its worth in fuel conservation. It is an excellent insulator for homes and industrial buildings and for loose fill insulation application. It is fire proof, vermine proof, and sound deadening and everlasting.

At the processing plant in Colorado Springs, a number of products are being made from the AlexItE after it has been expanded 10 to 20 times its original volume in a special furnace. In the past year many buildings have been erected, and many machines added. One machine grinds the ore down to minus 325-mesh. This is for the AlexItE Skin Protector, paint expander, etc.

A continuous mixer turns out 3500 lb. of "GardenGro" per hour. GardenGro is a mixed organic fertilizer

in which AlexItE is used as a soil catalyst, water retainer and mineral carrier.

Other Markets

The smaller sizes are used in making a floor compound known as "Absorbit," sales of which continue to increase. Service stations, machine shops, etc., are users of Absorbit. It is used in steel mills and machine shops to reclaim clothes, shoes, belting and other such materials which have been oil-soaked.

With the new and modernistic homes being designed for post-war building there will be complete wall panels which will furnish the outside wall material, the mineral cork insulation and the interior finish in one panel. These will be made of the new product, "PlastAlex."

AlexItE is sometimes used instead of sand in the mixing of plaster and concrete, giving high insulation factors as well as less weight per cubic foot. Great saving is made in the framing construction of a building. AlexItE is one-tenth the weight of sand with ten times the insulation value.

Anticipating the increase in demands for their products in 1945, the company has just purchased the Dead Mule Mine, south of Canon City, Colo. Carloads of raw ore are now being shipped from Canon City.



Vermiculite mine of AlexItE Engineering Co., Powderhorn, Colo.



V. P. Ahern, left, and J. S. Coxey, Jr.

ROUND-TABLE, informal discussion of specific problems of current interest to the industry featured the tenth annual meeting of the National Industrial Sand Association. Sessions were held May 23 and 24 at the New Yorker hotel, New York City.

The officers and the entire board of directors were re-elected for a second term in accordance with tradition. Officers are T. C. Matthews, Pennsylvania Glass Sand Corp., president; A. Y. Gregory, Whitehead Brothers Co., vice-president; and George A. Thornton, Ottawa Silica Co., treasurer. The Board of Directors also comprises Hamilton Allport, E. M. Durstine, Sterling N. Farmer, C. M. Hardy, W. J. Muhlthner and Harry P. Spier.

PRESIDENT MATTHEWS opened the meeting with a few informal remarks. He paid tribute to two deceased members, former president L. M. Hansen and Bert Bivins, for their outstanding contributions in the formation and development of the Association. The magnificent job the industry has accomplished in meeting the unprecedented demands for its products in war production was credited by Mr. Matthews to the close cooperation of the membership in the solution of its problems. The Washington office was signalled out for special appreciation for its accomplishments in the solution of governmental and engineering matters.

Compensation Insurance—Legislation

THEODORE C. WATERS, Association Counsel, discussed recent negotiations held with the National Council on Compensation Insurance with respect to the reduction of insurance rates applicable to silicosis, and commented on recent legislation and court decisions on compensation of particular interest to the industry.

The fact that insurance carriers believe the time right for reviewing rates for silicosis compensation, based on their experience, is believed significant by Mr. Waters. In the past, insurance companies have been prejudiced by common law suits and

War and Postwar Problems

National Industrial Sand Association annual meeting in New York City, May 23-24, discusses labor relations, legislation, research, reemployment, manpower, and price control

have charged higher rates than actual experience has warranted, partly to build reserves against unforeseen future claims.

During recent sessions of the State legislatures, hundreds of bills pointed toward amendments to compensation laws were introduced, he said. The trend of legislative thinking is pointed toward liberalizing benefits and extension of the types of coverage to provide for additional injuries and occupational diseases. Mr. Waters confined his discussion principally to the highlights of amendments proposed. A few had already been passed and made into law.

In Iowa and Tennessee, proposed statutes failed to pass, and a bill

introduced in Texas that would have included occupational diseases among compensable injuries was defeated.

In Colorado, a new occupational disease law was passed making 22 classifications of diseases, including silicosis, compensable. Occupational diseases are compensable only where total disability has resulted, total disability being defined as totally incapacitated to perform any work for remuneration. In Maine, a bill becomes effective January 1, 1946, that covers 13 occupational diseases. Dust diseases are excluded. In New Mexico, effective July 9, 1945, a bill making 29 occupational diseases compensable and including silicosis and asbestos becomes effective.



Reelected officers of National Industrial Sand Association. Left to right: T. C. Matthews, president; A. Y. Gregory, vice-president; and George A. Thornton, treasurer



Luncheon group at recent meeting of National Industrial Sand Association. Left to right: A. N. Farmer, J. M. Strauss, Arthur B. Schlesinger, J. S. Cable, and W. J. Muhlthner

INDUSTRIAL SAND

Among amendments, the Workmen's Compensation Act in West Virginia eliminates the separate elective provisions for silicosis compensation and transfers the silicosis compensation fund into the general workmen's compensation fund, effective June 5, 1945. Benefits have been increased for each of the three stages of the disease. The bulk of the silicosis fund is to be liquidated and distributed to the subscribers, indicating, in Mr. Water's opinion, that the rates paid were unjustified. The new rates will be nominal by comparison with the old and subscribers will contribute according to their individual experience on a year by year basis.

In Pennsylvania, two bills were enacted ready for signature that would increase compensation payments for silicosis and benefits. Similarly, an amendment to the New Jersey Workmen's Compensation Act would increase benefits. In Michigan, a bill was introduced that purports to repeal the existing provisions denying payments for partial disability. An amendment would add five compensable diseases in Maryland while striking out the provision denying com-



Mrs. C. Bryant Hartmann, left of Geo. W. Bryant, Core Sands, and Al Miller, Whitehead Bros., New York, N. Y.

pensation for partial disability from silicosis or asbestosis. In Oklahoma a senate bill, if passed, would extend the Workmen's Compensation Act to cover injury resulting from any disease.

Mr. Waters concluded his discussion by outlining a few recent legal decisions (not in the industry), to indicate the trend of judicial opinion in

matters of compensation. In one case, now pending before the Court of Appeals in New York State, under the Common Law Act, an employee has alleged that he contracted tuberculosis through negligence of his employer. If the Court sustains the claim, this case will have serious implications, in Mr. Water's opinion.

In a case involving the North American Refractories Co. in Pennsylvania, decided before the Superior Court, an employee died who had been known to have a valvular heart condition for 50 years. The statute provides compensation when silicosis is the sole cause of disability or death but not if silicosis is only contributory, yet this case was ruled compensable. The employee had died as a result of gasping for breath brought about by a fibrotic condition of the lungs.

In a third case, involving the American Smelting and Refining Co. before the Supreme Court in New Jersey, it was held that a case of pneumonia was compensable when a man was compelled to work in places alternately hot and then drafty. The court ruled the exposure to be more

(Continued on page 98)

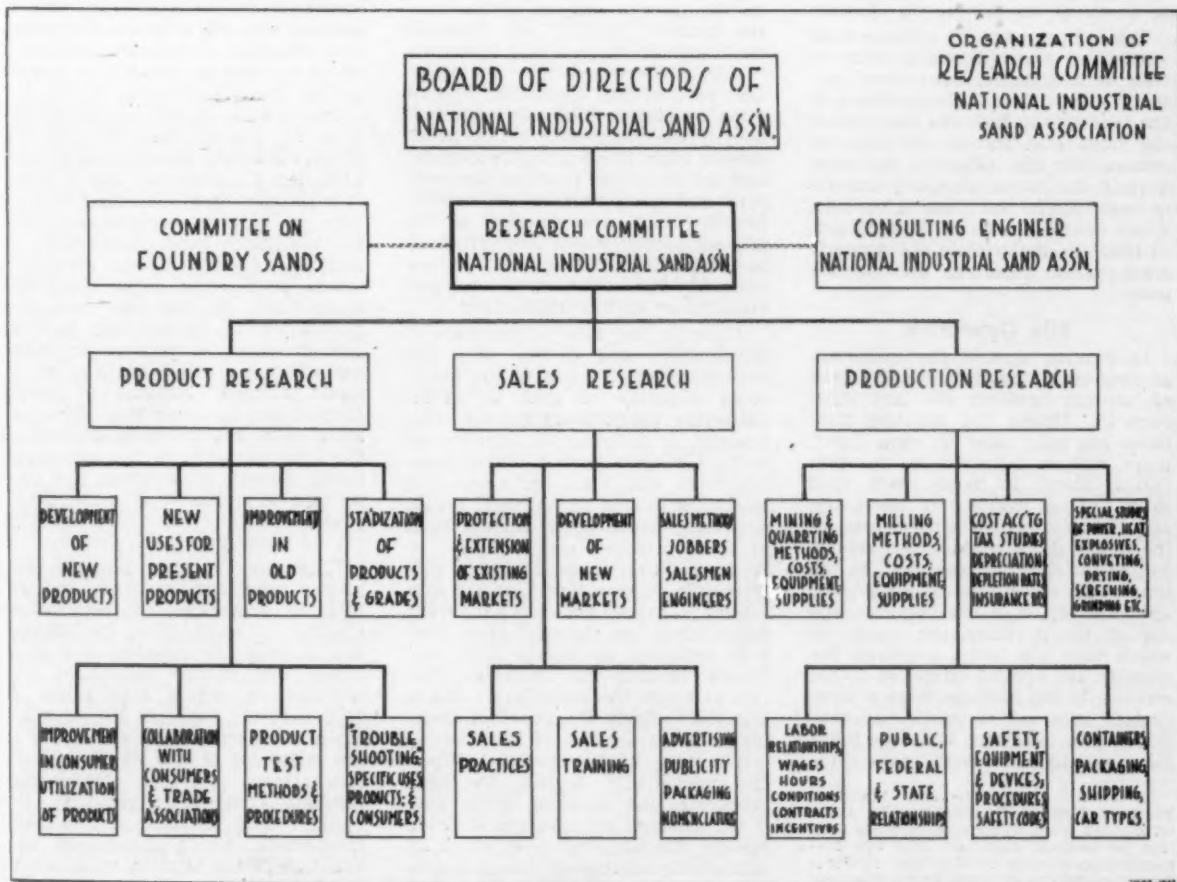
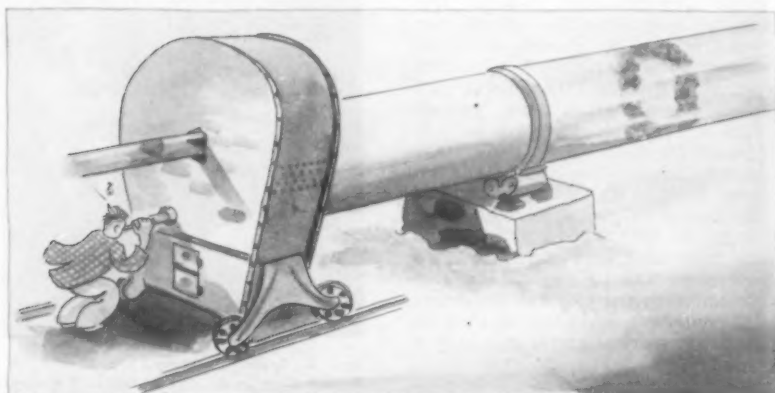


Chart showing proposed organization set-up of Research Committee

Chemists' Corner

Rings in Cement Kilns

By HAROLD R. GINGERICH*



Part 2: Effects of kiln operation on ring formation and removal

THE INFLUENCE of the raw materials and the fuel on ring formation in kilns, and the part of the chemist through control of mix, were discussed in the first part of this article, published in the June issue, pp. 86-89. The present instalment deals more with the part kiln operation plays in ring formation, and with various methods, mechanical as well as chemical, for getting rid of rings.

Some kilns seem to operate more efficiently, when a slight neck or ring is in evidence, than when perfectly clean. This is due perhaps to the tendency to hold the heat nearer the front end. But as the ring increases, the kiln efficiency decreases sharply due to an excessive amount of heat held in the front of the kiln, which causes cooling of the feed end, so that the material is not properly dried before reaching the burning zone.

Kiln Operation

In burning cement raw materials, an important factor is the intimacy of contact between the individual particles. Unless the reacting particles are very close to each other, there will be little or no reaction taking place. In most cases with solids, actual contact is necessary, and the greater the surface area of the materials in contact, the greater will be the speed of reaction. The intimacy of association is dependent upon the shape of the particles, the size of the particles, the extent to which they are mixed together, the porosity, the area of surface in actual contact. If the particles have a large surface area and a small cross-sectional area, reactions will take place more rapidly than with more com-

pact pieces. The size of particles influences speed of reaction as the same weight of small particles has a larger surface area than one of larger particles; hence, fine grained fluxes are more active than coarse ones.

If complete combustion is not attained in burning, the stage to which the reaction has progressed depends not only on the temperature but also on the time or rate of heating and the general physical and chemical conditions of the reacting materials.

Kiln temperatures play an important part in ring formation. Fluctuating or uneven kiln temperature is one of the conditions found in all cement kilns. It is impossible to maintain an absolutely uniform temperature due to a number of variable factors which are inherent in the process, among which are variations in composition and quantity of raw material, and variations in coal and quantity of air for combustion.

Allowing the kiln to decrease in temperature and become cold will necessitate the burning of the maximum quantity of coal to attain clinkering temperature quickly. This practice is followed to restrict the amount of underburned clinker passing from the kiln. An alternative method is to stop the kiln and regain clinkering temperature quickly. Both of these practices are conducive to forming clinker rings. The wide difference in temperature until the kiln attains its proper heat has a different effect upon the material than that heat attained by slowly and uniformly heating the material. The rate at which the temperature of the kiln rises affects the apparent melting point as a result of the thermal conductivity of the material. When the conductivity is low, the heat penetrates the material slowly and, if the external temperature is rising rapidly, the temperature at which an appreciable amount of fusion occurs is higher than would be required if the temperature were rising more

slowly. The temperature of fusion of the entire mass of material will be altered, as will be the rate of recombining. Thus conditions are set up within the kiln which change the normal procedure within the clinkering zone.

The use of the maximum amount of coal causes more ash and sulphur to be caught in the magma and this increased contamination per unit of surface will aid in promoting rings. The amount of coal ash caught is much higher when the kiln is stopped as the material remains in place.

Overheating of kiln is not uncommon in cement burning practice. When clinkering temperature exceeds 1400 deg. C., rings are apt to start. It is thought that when the temperature of burning becomes excessive an unusually large proportion of liquid is formed during clinkering which may form rings. Improper composition of the raw mix and fluctuations in the mix may necessitate excessive temperature in burning which will alter the amount of liquid formed. Amount of liquid formed does not vary with the lime-silica ratio but the total content of the lime-silica affects the amount of liquid formed by altering the percentage of available alumina, ferric oxide, and minor components which act as fluxes promoting fusion.

Rings may be formed by the improper regulation of draft and air blast by preventing the removal of alkalis. In short kilns, the alkalis and sulphur are expelled to a great extent due to the high back end temperature, which may range to 1000 deg. C.; while in longer kilns, where back end temperatures are as low as 300 deg. F., the alkalis become concentrated and total alkalis and sulphate content increases in the clinker. The alkalis and sulphur compounds, which decompose and volatilize in the burning zone, are to a great extent carried to the back end of the kiln where they condense

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and become caught in the raw material as it moves forward to the firing end of the kiln.

The design of the kiln influences the formation of deposits. It has been found in practice that the smaller the diameter of the kiln the greater is the tendency to form rings. The material in moving forward has a greater opportunity to build on deposits as the reduced surface area of the kiln allows the material and coating more intimate contact. The kiln diameter also affects the flame temperature and degree of contamination by coal ash and sulphur. The diameter of the sintering zone of many kilns has been enlarged, which is instrumental in discouraging ring formations.

The length of burning flame has been a controversial subject. A shorter flame in burning has more opportunity to promote rings than a long flame as it attains a higher temperature, concentrated in a shorter burning zone. The temperature of the zone immediately beyond this small area would be much lower and there would be a tendency for the raw material in passing to the hot zone to experience too rapid a change of temperature for normal reactions to occur. High temperature in a short burning zone will produce a more dense and uniform coating.

Rings may form at the tip of the flame, as the tip impinging on the raw material deposits more coal ash, which is immediately taken up by the partly liquid mass. When burning with a short flame, the greater the volume of air used with its hotter and shorter flame, the closer the ring will be formed to the front of the kiln. Also, the smaller the volume of air which is being used and the longer the flame, the farther from the front of the kiln the ring will be formed. A longer burning flame will result from slower ignition of the coarser particles of coal. Extreme fineness of coal tends to hasten combustion and shorten the burning flame.

Uneven flow of materials affects burning. The change of slope of the kiln should not occur too rapidly as the rapid flow of part of the raw material before it is properly treated may result in the material baking into the kiln wall and starting rings. Rapid flow of materials would also affect the gas flow rate by reducing it and permitting more cooling. Rings may be formed where the material is subject to the most violent change, as too sudden a change from the wet state to dry state. After the ring has been started the larger it becomes, the more the down-coming feed is shielded from the heat and consequently the more accentuated will be the change in the condition of the material.

Composition of Rings

Analysis of ring materials is of three classes:

1. Ring material with high sulphur trioxide and alkalis content. Alkalies volatilize to a certain extent at high temperature in the vitrification zone. The relative volatility of the alkali compounds in the mix depends upon the temperature at which the clinker is burned and also upon the nature of the raw mix. The coal used is mostly to blame for this type of clinker ring. High percentage of fluxes in coal is an important factor. Coal ash composition consists mainly of silica, alumina and iron oxide. This type of clinker ring condition can be controlled by adding part of the coal to the raw mix or by adding finely ground limestone to the coal. This procedure will result in flame reduction but no sulphur trioxide will be caught in the clinker.

2. Ring material with high dicalcium silicate content but with enough alumina and iron to prevent dusting.

3. Insufficient sesquioxides which dust on cooling.

The latter types of ring condition can be remedied by adjusting the raw mix with sufficient lime, together with fine and uniform raw grinding.

Eliminating Deposits

A number of methods for the removal and prevention of slurry and clinker rings have been devised and tried with varying degrees of success. These methods of removal and prevention may be grouped according to the ring material from which they were formed. Methods used in slurry ring removal include chains, loose weights, knives, vibrations, impact blows, scrapers, lifter plates and bars. Methods used in clinker ring problems include loose refractory weights, widening kiln, scrapers, gun, blasting, cooling ring using either air or water, burning off deposit, placing ribs in kiln.

Slurry Rings

The higher the initial water content in the slurry, the greater will be the tendency to form slurry rings. The expulsion of the mechanically held water in large quantities affects the physical state of the mass of the raw material and this sudden change may cause the material to build layers of slurry. There are instances when slurry rings have been formed when the water content of the material has been low.

Iron chains are attached at the preheating zone of the kiln which slide inside the drum on the lower side while the kiln rotates. These chains break up or scrape off large deposits of material as the kiln rotates. Sometimes to make the chains more effective, weights are placed between the chain links or at the suspended end of the chain.

Heavy loose metal weights are placed in the preheating zone of the kiln. The weights are prevented from traveling through the kiln by means of blocking rings. This system is not very effective as the weights are apt to crush the material excessively. A refractory weight may be used in the kiln section ahead of the sintering zone for the same purpose.

Iron or refractory knives may be attached to the kiln lining. They are made sharp in the direction of kiln rotation so that they cut the deposits in the preheating zone.

Rings which have a tendency to form in the softening zone at the beginning of the sintering zone to the point where the kiln cross-section is reduced in area may be avoided by widening the kiln at this point. The principle is that when the ring deposit has grown to the point where it starts to break up owing to its own weight, it has just filled the space provided by the widening.

Subjecting the shell of the kiln to vibrations to loosen deposits has been tried. In this method the traveling rim of the drum is provided with cams so that when the rim travels over the supporting roller the entire drum is raised and then suddenly dropped. The cams are placed in the drying zone and are separate from the remainder of the kiln.

A system has been used in which the outside of the drum is hit with impact hammers attached to the drum. This method is used in the preheating and sintering zones. The hammer tips into drop position at each rotation of the drum and drops on the drum at the opposite side. It has been found to be more effective in removing ring material by placing an impact pin through the drum wall at the zone of deposit. This pin is held in place flush with the inside of the drum wall by a spring. In this way, the impact of the hammer will drive the pin into the deposit and break it.

Scrapers are sometimes used. This consists of a stationary rod extending into the preheating zone to which a number of scrapers are attached. The apparatus is provided with springs. This method has been used at a number of plants. A variation of the scraper has been tried, using a metal plate shaped to the curvature of the drum which is attached by way of a joint in the rod. This plate slides at the bottom beneath the material as the kiln rotates. It is more difficult to use this device in the sintering zone owing to the high temperatures at the lower end of the kiln.

Clinker Rings

A scraper is used for periodic removal of deposits in the sintering zone, the scraper being used while the

(Continued on page 75)

* Williams Brothers Corp., Tulsa, Oklahoma, has recently completed for the Louisville Gas & Electric Company the construction of 58 miles of 8 inch natural gas pipe line and 7 miles of 12 inch line. With the help of Gulf quality lubricants and fuels, the project was finished well ahead of schedule.



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well ahead of schedule"——**

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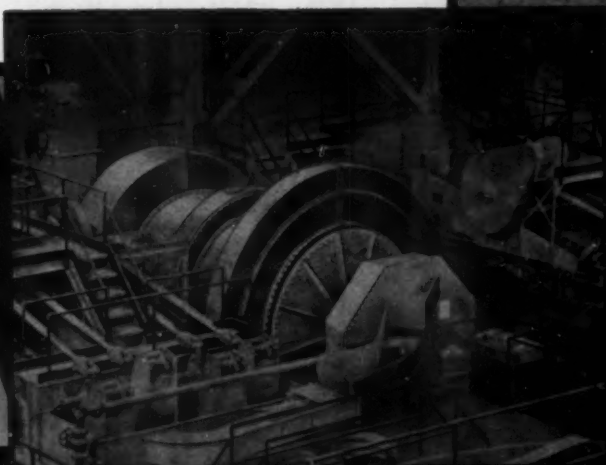
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Overall view of silica sand deposit and plant near Columbia, S. C.

Gaines W. Harrison, Columbia, S. C., plans to install beneficiating equipment for manufacture of glass sand

SAND for the Fertilizer Industry

REALIZING the potential market for glass sands and other industrial sands, Gaines W. Harrison, Columbia, S. C., has started construction of a drying and screening plant to process the high quality sand found in this area. The pit that Mr. Harrison purchased in May, 1944, was exploited previously for concrete sand only, which was loaded and shipped with no processing. At the time the plant was visited, the drying equipment was installed and the production of fertilizer filler was well under way. Early installation of screening equipment was anticipated which would allow the production of engine sand, filter sand, and other

industrial sands. Plans are under way to install some means of beneficiation which will permit production of glass sand suitable for bottle glass manufacture.

An almost inexhaustible supply of sand is available in the large deposit which outcrops just South of Columbia. The deposit is in the Fall Line, which originally, millions of years ago, was the coast line of the Atlantic Ocean. Several producers are exploiting the finely graded sand, which not only meets specifications for concrete sand but which also has a chemical analysis which permits it to be sold for other uses.

The 119-acre tract now being worked by Mr. Harrison has a 62-ft. strata with a negligible overburden consisting of scrub oaks and grass. This is stripped by an 18-cu. yd. Le Tourneau scraper pulled by a No. 80

Caterpillar Diesel tractor. Two cranes, a Northwest and an Ensley, reclaim the sand and load it into railroad cars which are taken to the plant by a 10-ton Plymouth locomotive, over standard gauge track. The cars bottom-discharge to a track hopper, equipped with a Barber-Greene feeder, which moves sand by a bucket elevator, 18-ft. centers, to a 12-in. screw conveyor, 24-ft. centers. The screw conveyor, installed above five No. 1 Sutton dryers, shown in an accompanying illustration, has openings in the trough to allow discharge by gravity into the dryers. The dryers, which require about three tons of coal per day for the battery of five, discharge to chutes feeding a bucket elevator, 29-ft. centers, which moves sand either to cars for delivery or to the proposed screening arrangement which will be installed later. Two



Pipe, shown in the upper left corner, discharges a small stream of wet sand from screw conveyor into elevator, the buckets of which are loaded with hot sand from the dryers

Feeding wet sand from screw conveyor through chutes into battery of dryers



DRYING



Ten-ton locomotive which hauls railroad cars to plant and onto siding

4- x 10-ft. Tyler Hum-mer screens will be installed for sizing the product.

Step Up Drying Capacity

Installation of a 6-in. pipe in the trough of the screw conveyor above the dryers, midway in the length of the trough, has increased production by about 25 percent. The by-pass pipe sends a small amount of wet sand directly into the bucket elevator carrying the dry sand. The coating of wet sand falling on top of the hot dry sand in each bucket dries by association by the time the elevator reaches the discharge point and thereby increases capacity. An accompanying illustration shows the pipe in relation to the bucket elevator.

Production is about 100 tons per day, in addition to the sale of concrete sand which is reclaimed directly from the pit for delivery. A comparison of the sieve analysis of the sand in this deposit with the requirements of the State Highway Department follows:

Pit Sand	Highway Specifications
Passing No. 8—100.....	75—100
Passing No. 16—98.....	55—98
Passing No. 30—75.....	25—75
Passing No. 50—25.....	8—30
Passing No. 100—4.0....	0—7

It will be noted that the sand is in the upper limits of specifications. Good results have been obtained with this sand as a fine aggregate in both structures and pavements.

Plans for the utilization of this sand for glass manufacture have been inspired by the chemical analysis which shows that it is acceptable for bottle glass with little beneficiation. The chemical analysis follows:

	Percent
Silicon dioxide (SiO_2).....	97.3
Iron Oxide (Fe_2O_3).....	0.188
Aluminum Oxide (Al_2O_3).....	1.66
Titanium Oxide (TiO_2).....	0.252
Calcium Oxide (CaO).....	0.00
Magnesium Oxide (MgO)....	0.00

Future plans, as before stated, include the addition of some means of

beneficiation which will remove impurities and thus allow the manufacture of a sand for higher grade glassware.

Kiln Rings

(Continued from page 71)

kiln is stopped. The rod and scraping off tool are water-cooled. The rod may be pulled back and forth either by hand or by a motor. The kiln is turned a little after a part of the ring has been broken loose. This device has not been satisfactory as the kiln cools too much. A device with a rod having a scraper at the head is used. The rod is made stronger so that it can be turned. Cooling water is supplied in a tube inside the rod. The kiln is turned slowly while the rod is pushed forward very slowly as though a hole were drilled on a lathe. This device has been found to be excessively injurious to the coating. The quantity of water left in the kiln is injurious too.

Guns may be installed in front of the kiln for ring removal. Iron shot is discharged from it with powder or compressed air against the ring. This method may be expensive if used often.

Sometimes the deposit may be removed by stopping the kiln and allowing the ring to shrink due to inflowing cold air so that it falls apart. This may be facilitated by pouring cold water over the kiln at the periphery of the clinker ring.

The deposit may be burned off if the burner can be shifted about. This is not possible if a cooling drum is attached to the kiln.

Clinker rings are removed by using longitudinal ribs in the kiln lining. This causes the deposit to loosen quicker. This procedure is satisfactory only with certain kinds of raw materials.

Sometimes a section of cooling ring is installed in the kiln lining. This is placed within the sintering zone. It requires only a small section of the kiln circumference.

Ring removal is often done by destroying the clinker ring formed in a kiln during the calcining operation by directing against the under face of the ring a current of cold air to effect the cooling and consequent contraction and buckling down of the ring.

Another method of blasting clinker ring by means of a shell charged with liquid carbon dioxide. This liquid is gasified by a chemical heating mixture which is ignited by an electric exploder. The shell is placed in one of several openings previously made in the kiln shell at ring forming zones of greatest frequency.

A number of methods have been tried for prevention of clinker ring formation. One is by cooling the kiln from the outside at the point of usual ring formation. The principle

of this is to prevent the material near the lining from reaching the temperature needed for deposit. To be effective, this cooling zone must not be too short.

Another method of prevention is to charge along with the raw material some pea-size clinker into the kiln. This will prevent the baking-together of raw material.

Corundum Production

DOMESTIC production of corundum, an aluminum oxide abrasive, is increasing, according to a Bureau of Mines report. As the result of the large war-time demand, corundum deposits in Georgia, North Carolina, and Montana are now being worked, in some cases after 25 years of inactivity. Since 1921, when American industry turned from Canadian sources to the Union of South Africa, the Transvaal deposits have supplied nearly all the corundum used in the United States. Current reports on domestic production are confidential and have not been released. More complete details may be obtained by writing to the Bureau of Mines, Washington, D. C., for Information Circular 7295, "Corundum" by Robert W. Metcalf, mineral economist.

Barite Production Slumps

SEASONAL winter shut-downs and exhaustion of some low-cost reserves in Georgia and Tennessee have been in part responsible for a drop of 14 percent in barite production in the fourth quarter of 1944 as compared with the third quarter. Production of primary barite was 136,437 tons in the fourth quarter of 1944 as compared with 106,639 tons for the comparable period of 1943, reports the Bureau of Mines. In 1944, production of barite totaled 516,582 tons compared with 410,633 tons for 1943. Primary barite includes crude lump and pebble barite (except hand-mined barite) from all States except Arkansas and includes ground barite produced by flotation in Arkansas.

Arkansas Nepheline

BIG ROCK STONE & MATERIAL CO., Little Rock, Ark., has been shipping nepheline ore out of Arkansas for processing. American glass makers are getting the major part of their requirements from Canada. The newest use for the ore is in the manufacture of rock wool.

Glass in Colorado

DENVER GLASS BOTTLE CO., Denver, Colo., subsidiary of The Knox Glass Manufacturing Co., has purchased the E. & E. Glass Products, Inc., and will recondition the plant at a cost of \$98,000. Sand, lime and feldspar for glass manufacture will be obtained locally.

High Volume of Low Temperature Gases Required for Lime Burning

TO PRODUCE a high grade lime of fine, honeycombed structure, either high-calcium or dolomitic limestone should be burned in a high volume of low temperature gases. In attaining this high volume and low temperature, however, there must be a minimum loss of heat. Lime made under these conditions also should produce a hydrate which will readily accept the water, and will have superior chemical solubility, reactivity, availability and settling rate.

In the accompanying illustration is shown an improved design vertical kiln recently patented by Victor J. Azbe which, it is claimed, meets the above qualifications. As pointed out by Mr. Azbe in his patent claims, this kiln is said to be particularly effective in burning a dolomitic limestone. "At lower temperatures of calcination, the resulting smaller cubical crystals, of lower density, present a greater outer as well as an inner surface area. With more exposed surface the rate of hydration, a surface reaction, increases proportionately, and the resulting dolomitic hydrate,

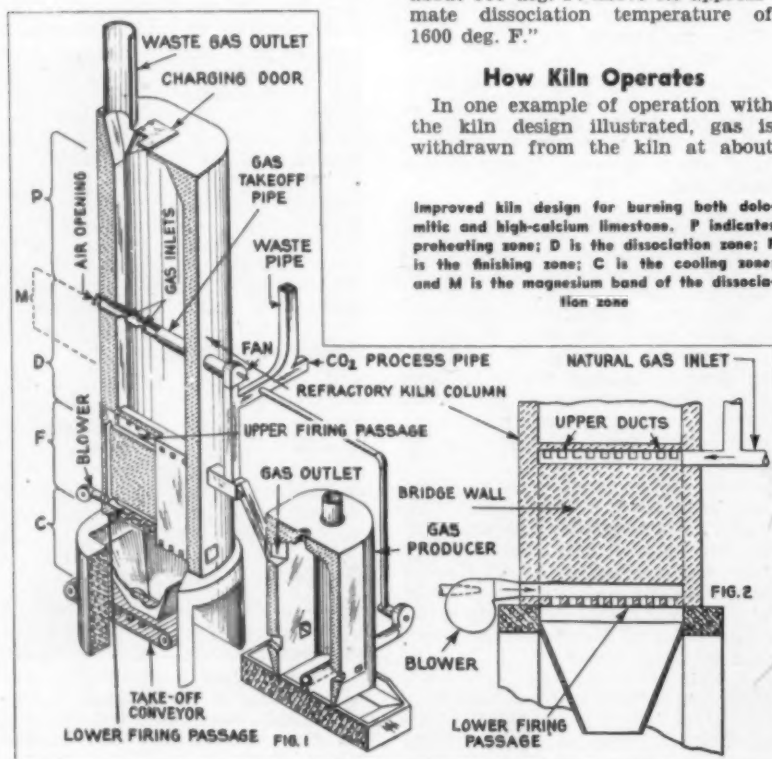
properly hydrated, instead of being composed in a great measure of the inert large crystals of MgO , has a good proportion of the very minute $Mg(OH)_2$ crystals.

"The fundamental masses of the calcium oxide component of lime (if not formed at overly high temperatures) are smaller and more porous, and thus more advantageous. This calcium oxide is also impaired by elevated temperatures but not as much as magnesium oxide. This is due mainly to two reasons; first, its tendency is not to form large dense crystals but rather those of a smaller and more open type; and second, calcium oxide is normally never heated to such high excess temperatures above its dissociation level as magnesium oxide. The magnesium oxide may, for example, pass through the kiln hot zone at a temperature of 2500 deg. F., or practically 1500 deg. F. in excess of its approximate lower dissociation temperature of 1000 deg. F. The corresponding excess in the case of calcium oxide under these conditions would be only about 900 deg. F. above its approximate dissociation temperature of 1600 deg. F."

How Kiln Operates

In one example of operation with the kiln design illustrated, gas is withdrawn from the kiln at about

Improved kiln design for burning both dolomitic and high-calcium limestone. P indicates preheating zone; D is the dissociation zone; F is the finishing zone; C is the cooling zone; and M is the magnesium band of the dissociation zone



1000 deg. F. and returned to the kiln hot zone, reducing the hot zone temperature from 2500 deg. F. to 2200 deg. F. or even less (1800 deg. F. or lower) if so desired. Mr. Azbe has determined that the magnesium carbonate has two dissociation temperatures, according to whether it is heated slowly or quickly, the lower one of which is about 1000 deg. F.

Heat low in elevation, that is, below 1350 deg. F. in high-calcium kilns and below 950 deg. F. in dolomitic kilns, is spent and ordinarily is utilized only for preheating of stone. But it is known that kilns have more heat of low elevation available than is necessary for stone preheating, that is, more gas of this temperature passes up the stone preheating and stone storage sections of the kiln than is needed for stone coming down the kiln.

A part of the process with this improved design includes the withdrawal of hot gases from the end of the calcium-dissociation zone in the case of high-calcium lime kilns or from within the magnesia-dissociation zone in the case of high-magnesia lime kilns; and the use of these excess gases for circulation to gas producers, or for production of chalk, dry ice, air preheat, drying, or any other CO_2 utilizing process. By withdrawing these gases, the kiln becomes relieved, which immediately shows up as increased draft in the hot zone, bringing in greater quantities of air and allowing admission of a larger amount of combustible, thereby increasing capacity.

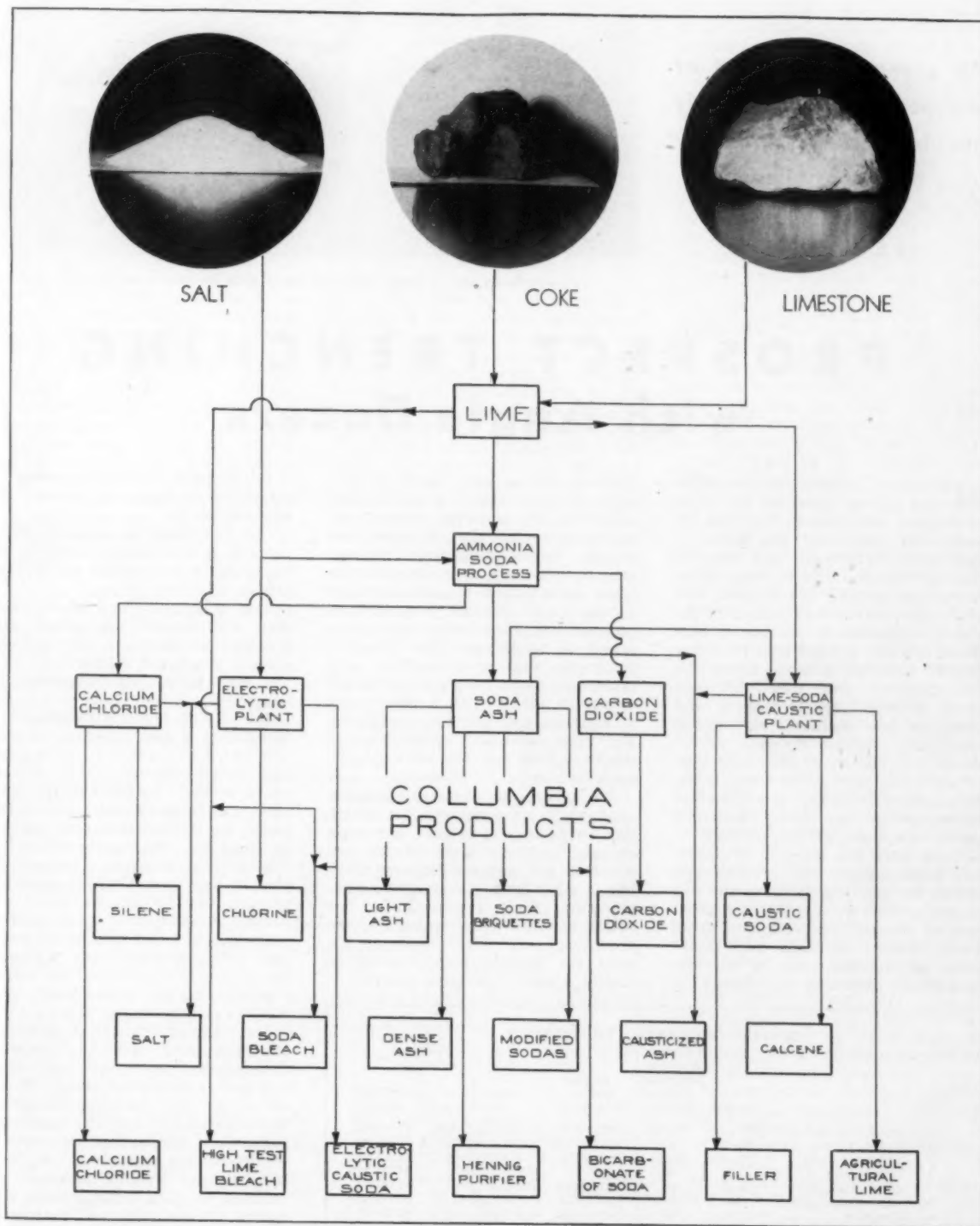
Kiln May Be Charged at Any Time

This type kiln has a mild induced draft, and the kiln top may be open and stone can be charged at any time rather than at the definite periods ordinarily necessary. Increased capacity brought about in this way also is said to increase efficiency through reduction of radiation loss, etc.

This design also utilizes kiln gases in a gas producer which serves the kiln. By this means, there is achieved recirculation of a greater quantity of gases, maintenance of a lower temperature in the hot zone, and an increase in efficiency. It also provides for preheating air needed for the gas producer and it effects certain cooling functions of the gas-withdrawing apparatus. It is further claimed that

(Continued on page 96)

Limestone—Basic Raw Material in Chemical Industries



Flowsheet shows the important part that limestone as a raw material plays in the processing of many vital chemical products. Silene is an hydrated calcium silicate and calcene a precipitated calcium carbonate. It also is of interest to note that one of the end products is agricultural lime

Mining

An economical method of prospecting for minerals has been developed by
Bureau of Mines

By S. H. LORAIN*



Angle dozers offer a cheap method of trenching in prospecting for minerals

PROSPECT TRENCHING with Angle Dozers

MECHEANIZED DIRT-MOVING EQUIPMENT has greatly increased the scope of prospect trenching by lowering the costs and increasing the speed of such work. Where the soil covering was more than 3 or 4 ft. deep, operators were quickly discouraged and abandoned surface exploration in favor of shaft sinking, drifting, or diamond drilling; wildcat trenching was seldom undertaken even where the soil covering was thin. Although power shovels, trench diggers, and draglines are useful under special conditions, crawler-mounted angle-dozers will usually do the same type of work and have a far wider range of adaptability. They are therefore incomparably the most generally useful equipment for the purpose.

Since 1939 the Bureau of Mines' has been engaged in a widespread search for minerals useful to the war program. This work required a great deal of pioneer exploration in areas where known outcrops were marginal or subcommercial by pre-war standards. Engineers in charge of

field operations were quick to perceive the applicability of mechanized trenching on a fairly large scale, particularly in the Northwestern States, where completely exposed vein outcrops are rare. Probably no other organization to date has done a comparable amount of angledozer prospect trenching under such a wide range of conditions. The following comments and accompanying cost tables are based on work performed chiefly in Idaho, with a wide range of physical and climatic conditions. The most important applications of the angledozer for such work may be described under three heads:

(1) Quick and cheap preliminary exploration of prospects for which the surface exposures are good enough to arouse some interest but which do not warrant diamond drilling or other form of underground exploration. Very frequently a few hours' or a few days' work with an angledozer will either eliminate the need for further consideration or justify a more expensive program.

(2) Tracing of veins, or other ore structures, as a guide to underground exploration.

(3) Trenching of areas in which there is good reason to suspect the existence of ore, but in which there are no outcrops.

The value and scope of this work may be illustrated most clearly by a few specific examples. The job references are to job numbers given in the cost tables accompanying this paper.

Jobs 1 and 2 were undertaken to investigate a few outcrops of stibnite-bearing quartz veins on a grass- and brush-covered hilltop. Several caved prospect pits and a few short adits, driven many years before, had failed to prove continuity between the outcrops. The results of the first few days of trenching, at a direct cost of less than \$1,000, resulted in proving one 500-ft. ore shoot and several ore shoots along a 2,000-ft. zone. Within a few months the owner was shipping high-grade antimony ore. Shipments continued for several years during the period when antimony was considered "strategic."

Job 3 was undertaken to determine the extent and value of a deposit of disseminated antimony ore, which had been exposed by erosion at only one point. The surrounding surface was soil-covered, and the underlying rocks were decomposed for 10 to 20 feet below the surface. A deep side-hill cut was required to reach unoxidized ore. The showing made warranted drilling, which ultimately led to discovery of a large body of high-grade tungsten-antimony ore.

TABLE I—EQUIPMENT AND RENTAL

Job No.	Make	Model	Approx. Drawbar h.p. Rating	Type Blade Control	Rental Basis	Rental Rate ¹
1	International	TD-40	33-45	Hydraulic	Fully operated	\$4.50 hr.
2	Caterpillar	D-2	25	Hydraulic	Fully operated	\$2.25 hr.
3	International	TD-40	33-45	Hydraulic	Fully operated	\$4.50 hr.
4	Caterpillar	D-7	80	Cable	Machine only	\$5.00 hr.
5	Allis-Chalmers	K-0	54	Hydraulic	Machine only	\$6.00 hr.
6	Allis-Chalmers	S-0	87	Hydraulic	Fully operated	\$5.00 hr.
	Cletrac ²	(1935)	55	Hydraulic	Machine only	\$4.00 hr.
7	Caterpillar	D-6	55	Hydraulic	Machine only	\$2.93 hr. ³
8	Allis-Chalmers ⁴	HD-7	60	Hydraulic	Fully operated	\$6.50 hr.
9	Caterpillar	40	40	Cable	Machine only	\$4.43 hr.

¹Rental includes repair maintenance. In most cases rental is per hour of actual operation. ²Gasoline powered. ³At flat rate per month. ⁴Equipped with winch.

¹Published by permission of the Director, Bureau of Mines, U. S. Department of the Interior.

²District engineer, Western Region, Bureau of Mines, Moscow, Idaho.

MINING

The first part of job 7 consisted of trenching for the projected extension of a lode of cobalt-copper ore, which had been partly explored by underground workings. The first results were discouraging, but a little wildcatting made possible by the equipment led to the discovery of a much larger, parallel lode, on which some diamond drilling was believed to be warranted. The drilling in turn resulted in the discovery of a third lode, which proved of commercial importance.

Other evidence of similar mineralization existed over several square miles, but the surface was entirely covered with 3 to 10 feet of soil and a heavy stand of lodgepole pine. Outcrops were practically nonexistent, and the ore was so deeply oxidized that subsurface exploration was necessary to determine metal content. Thorough exploration by drilling would have entailed prohibitive costs. Consequently, large-scale trenching operations were carried on coincidentally with drilling. The purpose of this trenching was, first, to eliminate as much weakly mineralized area as possible and, second, to permit wider spacing of drill holes in the most favorable areas. By trenching to expose the strong gossan ahead of drilling operations, it was possible to locate holes to the best advantage and, at the same time, to obtain visual evidence of the continuity of the ore structure between rather widely spaced drill holes. This resulted in a great saving of high-cost drill footage while permitting a fairly reliable preliminary estimate of ore tonnage.

Prospecting for Mica

Jobs 8 and 9 were essentially wildcatting operations for the purpose of disclosing mica-bearing pegmatites in a brush- and tree-covered area of one to two square miles, where valu-

able deposits of mica had been discovered at several widely separated points. The erratic habits of pegmatites nullified any attempts at systematic planning. Nevertheless, it was possible to track down a number of hitherto unknown mica pegmatites. Several contained mica ore shoots of commercial importance. The first ore shoot found is producing mica, and the exploration is still in progress.

The other jobs listed were similar to one or another of those that have been described. No. 4 exposed a small tonnage of marginal grade tungsten ore; No. 5 resulted in discovery of a small but high-grade copper ore shoot, which was immediately mined; and No. 6 gave positive information that will be useful in planning drill operations during the coming season.

The experience gained in this work permits several statements to be made regarding the most efficient selection and use of equipment. For work of this nature, no decided preference was formed for any make of machine; the condition of the equipment and the ability of the operator are much more important. Under most conditions, a heavy machine is cheaper than a light one. This is well-illustrated by jobs 1 and 2, where the lighter machine, at a lower rental rate, cost nearly twice as much per cubic yard under identical conditions (Table 4); the difference would have been greater in heavy brush or in timber. Jobs 8 and 9 gave nearly the same cost per yard for a heavy and a light machine on the same project; however, the heavy machine was used to clear the way through brush and timber while the lighter machine was used chiefly for clean-up work. In very rough country the heavier machines, with more power, can climb hills where a lower-powered machine cannot follow.

Under most conditions the hydrau-

lic-operated machine blade is better for prospect trenching than the cable-operated blade. Although many general contractors prefer the cable-operated blade because of mechanical simplicity, the hydraulic blade control provides the power needed for positive digging into the trench bottom.

Conditions for Efficient Angledozer Trenching

The ideal conditions for angle-dozer trenching are on bare or grassy slopes of 20 deg. to 30 deg., where the overburden is 5 to 10 ft. deep. By trenching along the contours, or at a slight down-hill angle across them, the operator can side-cast the soil with minimum waste motion. Steep slopes with less than 4 or 5 ft. of soil cover require transportation of dirt to build up a roadway; this results in a tremendous lowering of efficiency. The angledozer is an efficient dirt mover only when the distance moved is very short. This fact also limits the efficiency of the angledozer when trenching on gentle slopes or level ground. If the slope is too gentle to permit side-casting, all dirt must be pushed out one end of the cut; this limits the economic length and depth of the trench. Nevertheless, very good efficiency can be obtained on level ground if the cuts are less than 5 ft. deep. Trenches up to 10 ft. deep and 100 to 300 ft. long have been dug in level country at a reasonable cost.

Trees up to 6 in. diameter, if not too closely spaced, can be efficiently cleared by the heavier (60 hp. or over) machines. Larger timber or very dense growths of light timber should be partly cleared by hand and the stumps blasted. Hardpan, partly decomposed bedrock, and large interlocked boulders or rocks require preliminary blasting if the angledozer is to be used at its greatest efficiency. The relatively high cost per yard of job 6 was due largely to digging partly decomposed bedrock and frozen overburden without blasting. On the other hand, the cost per yard of job 3 was nearly average, even though more than 25 percent of the material moved was rock in place. Much of this rock was so thoroughly decomposed that it could have been moved by the angledozer without preliminary blasting; however, the efficiency of the equipment would have been greatly reduced and the over-all cost increased.

It is frequently necessary to clean the trench bottom by hand or even to sink shallow hand trenches below the bottom of the dozer trench. However, this work can be closely limited to places where ore structures intersect the main trench. It is also advisable to have an observer always on hand when the angledozer is digging near bedrock. Otherwise, important

TABLE II—JOB DESCRIPTION

Job No.	Linear		Classification of Material—Cu. Yds.			Vegetation	Average Cross Section Feet
	Trenched	Moved	Loose Rocks	Rock	Alluvium and Soil in Place		
1	1,800	3,600	3,600			Chiefly grass & sparse brush	4.5x12
2	1,730	3,460	3,940			do	6x10
3	600	9,500	6,900		2,600 ¹	Medium timber ⁴	21x45 ²
4	8,300	8,300	7,800	500		Grass	2.25x12
5	2,045	6,420	5,020	1,400 ²		Heavy brush & scattered trees	6.5x13.0
6	3,305	6,600	4,100	2,500		Chiefly grass & small trees	9x12 ³
7	9,552	50,800	37,900	10,400	2,500	Dense lodgepole pine	11.0x25 ³
8	11,390	14,800		9,300	5,500	Dense brush & scattered trees	3.5x10
9	7,200	9,300		5,900	3,400	do	3.5x10
Totals	45,922	113,260	69,260	30,000	14,000		

¹350 Cu. Yds. required rock drills; remainder drilled with specially designed hand augers. ²Numerous granite boulders weighing 1 ton or more. ³Side hill cut. Depth given for up hill slope. ⁴Hand clearing 18,000 sq. ft.

indications may be exposed and then covered again before they are recorded.

The accompanying cost tables² give only the direct cost of prospect trenching because it is believed that this will afford the best basis of comparison. Overhead charges, transportation, and preliminary excavations, such as access trail construction, differ in nearly every case. Furthermore, the equipment is nearly always used for other purposes, such as hauling supplies beyond the limits of truck transportation, excavating diamond-drill stations, snow removal, etc. On pioneer operations a tractor-dozzer for general utility uses has become almost indispensable.

The foregoing data show that prospect trenching by angledozer may be done at one-half to one-tenth the cost per linear foot of hand trenching, and at incomparably greater speed. The greater width of the trench bottom permits much better observation of geologic structure and more accurate sampling of any veins or lodes exposed. Furthermore, the trenches will remain open to inspection for much longer periods. These factors have greatly increased the usefulness of trenching as an

² The writer wishes to acknowledge the assistance given by staff engineers of the Idaho District, Bureau of Mines, in collecting and compiling the data given in the tables accompanying this paper.

aid to preliminary exploration in soil-covered areas.

Most of the outcrop discoveries in mining districts of Western States were made between 1860 and 1900. A considerable, but rapidly diminishing, number were made between 1900 and 1920, but very few new discoveries have since been made. It is concluded that most exposed vein outcrops in this region have been discovered, but that additional outcrop discoveries will result from the more general use of mechanical trenching equipment.

Value to Industry

EDITORIAL NOTE: The chief value of this article to ROCK PRODUCTS' readers is, we believe, in the cost data given. It concerns largely exploration of ore deposits, to uncover veins and outcrops. However, this method of exploration might be used to discover the depth and character of overburden on projected quarries and gravel plants, and in the case of rock, the character and surface condition of the ledge. It would also serve as an excellent method of exploring shallow sand and gravel deposits, for a prospective operator should know rather accurately where coarse and fine material may be located. Test pits 100 or more feet apart may not give enough such data.

—THE EDITOR

Phosphate Sales Increase

FIGURES of ground rock production and sale to farmers for direct application to the soil during 1944, which are so far obtainable indicate an increase of 30 percent over 1943, handled entirely through commercial channels. In 1943 the AAA handled approximately one-sixth of the Tennessee production with about double that amount from Florida into Kentucky and Illinois. During 1944 no Tennessee rock was handled through AAA, but that organization handled about twice as much from Florida as in 1943 and they have asked bids for 250,000 tons for 1945, none of which will likely come from Tennessee and it is quite doubtful if Florida will furnish the entire amount, even if AAA should order that much, as a great deal of Florida rock is now being supplied through the same commercial channels whose orders have absorbed the entire Tennessee production and could easily do the same with the entire Florida production in the present state of demand.

Fire at Stone Plant

M. C. LININGER & SONS crushing plant in Deadman's canyon near Lakeview, Ore., suffered a heavy fire loss which necessitated shutting down operations until new equipment could be installed.

TABLE III—OPERATING COST IN UNITS OF EQUIPMENT HOURS, LABOR, AND SUPPLIES

Job No.	Angledozer Hours			Lin. Feet Per Hour	Cu. Yds. Per Hour	Fuel and Oil										Man Hours		
	Per Lin.Ft.	Per Cu.Yd.	Total			Gal. Diesel Oil			Gal. Gas			Gal. Lube Oil			Per Lin.Ft.	Per Cu.Yd.	Total	
						Per Lin.Ft.	Per Cu.Yd.	Total	Per Lin.Ft.	Per Cu.Yd.	Total	Per Lin.Ft.	Per Cu.Yd.	Total				
1	0.027	0.013	48	37.5	75.0											.053	.027	96
2	0.081	0.035	140	12.3	28.0											.106	.046	183
3	0.297	0.016	178	3.4	63.3											2.738	.147	1657
4	0.017	0.017	142	58.7	58.7											.017	.017	142
5	0.100	0.031	206	10.0	32.1											.100	.031	200
6	0.100	0.050	330	10.0	20.0				0.22	0.11	720	0.02	0.01	66		.320	.160	1056
7	0.113	0.021	1081	8.9	47.4	0.259	0.048	2422				0.03	0.005	281		.182	.034	1753
8	0.032	0.025	309	30.9	40.0											.077	.059	881
9	0.031	0.025	234	32.0	39.7	0.091	0.070	660	0.007	.006	55	0.019	.015	140		.091	.073	678
	0.059	0.024	2722	17.0	42.4											.144	.058	6646

TABLE IV—OPERATING COST—DOLLARS

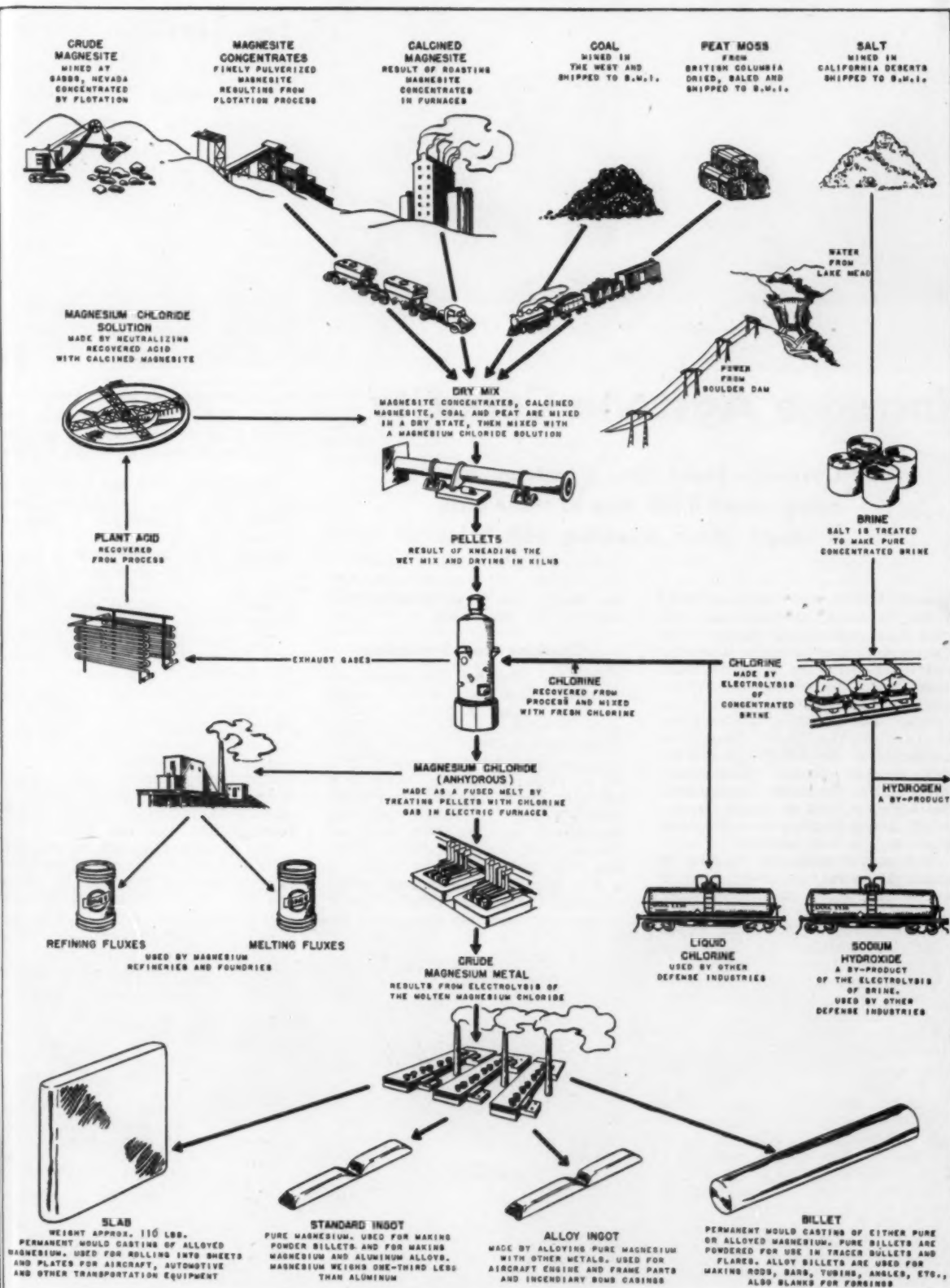
Job No.	Equipment Cost		Rental—Fuel—Oil			Labor Cost ²			Total Direct Cost ³		
	Rental	Fuel ¹ and Lubricants	Per Lin.Ft.	Per Cu.Yd.	Total	Per Lin.Ft.	Per Cu.Yd.	Total	Per Lin.Ft.	Per Cu.Yd.	Total
1	216.00		0.12	0.06	216.00	0.02	0.01	28.20	0.14	0.07	244.20
2	315.00		0.18	0.08	315.00	0.12	0.05	213.20	0.30	0.13	528.20
3	801.00		1.34	0.08	801.00	1.93	0.12	1,160.30	3.27	0.21	1,961.30
4	800.00	52.90	0.10	0.10	852.00	0.03	0.03	218.00	0.13	0.13	1,070.90
5	1,000.00		0.49	0.16	1,000.00				0.49	0.16	1,000.00
6	1,015.03	153.99	0.35	0.18	1,169.02	0.28	0.14	923.49	0.63	0.31	2,092.51
7	3,853.31	307.28	0.43	0.08	4,160.59	0.26	0.05	2,497.01	0.70	0.13	6,657.60
8	2,392.00		0.21	0.16	2,392.00	0.04	0.03	449.00	0.25	0.19	2,841.00
9	1,041.05	125.01	0.16	0.12	1,166.06	0.07	0.06	498.97	0.23	0.18	1,665.03
	11,433.39	639.18	0.26	0.11	12,072.57	0.13	0.05	5,988.17	0.39	0.16	18,060.74

¹Included in rental unless otherwise stated.

²Operators time included under rental when equipment rented on fully operated basis.

³Nominal explosive costs not included.

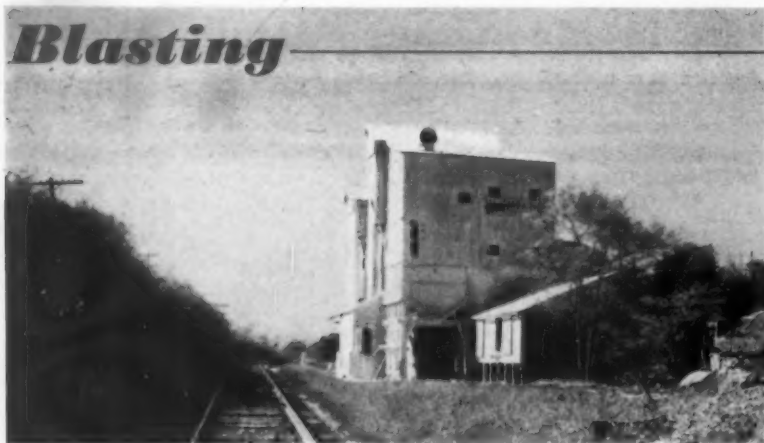
Magnesite—Its Part In Magnesium Manufacture



Pictorial flow sheet of magnesium manufacture by Basic Magnesium Corporation

Courtesy Reno Evening Gazette

Blasting



View of plant from main line of railroad

Increase Agstone Capacity

**Cerulean Stone Co., Cerulean, Ky.,
brings down 8,000 tons of stone with
a single blast involving 300 holes**

PRIOR to 1939, the Cerulean Stone Co., Cerulean, Ky., produced only road stone and railroad ballast. With the market for agricultural limestone making itself evident, a Jeffrey hammermill was introduced to produce more fines to meet this market. This crusher was added to the crushing equipment in 1939. Later, through the assistance of the A.A.A., demand for this product became increasingly large and a Gruendler hammermill was added in 1944 to supply the demand. About 70 percent of the total production is now agstone.

The quarry comprises an area of about 25 acres. A 60-ft. face is worked in a series of three benches, varying from 12 to 22 ft. in thickness. Two WD-10 Cleveland wagon drills are employed to drill holes starting at 2 3/8 in. and tapering to 2 1/2 in. in diameter. The first row of holes are drilled 8 ft. back from the face and are spaced 4 ft. apart. From 100 to 300 holes are blasted in one operation, which yields from 3000 to 8000 tons of stone. Dynamite and gelatin is used in a 60/40 ratio. Air for the wagon drills is supplied by two Ingersoll-Rand air compressors, one of which is powered by a 14-x 16-in., water cooled, stationary Diesel, while the other is a 9-x 9-in. air cooled, electric unit with a 50-hp. motor, and is truck-mounted. A 6-x 6-in. Smith air compressor supplies air for jackhammer work. A Lima electric crane with a 1 1/4-cu. yd. shovel and powered by a 60-hp. Westinghouse motor, loads stone onto five 1/2-cu. yd. trucks which haul to the crushing plant. Two of the trucks

are Fords, one is an International and two are Chevrolets.

Crushing and Screening

Primary crushing operations are performed by a No. 16 Allis-Chalmers gyratory crusher. A bucket elevator, with 12-x 25-in. steel buckets on a Goodyear belt, 70-ft. centers, transports material from the crusher to a 4-x 14-ft. Simplicity triple-deck vibrating screen. The two upper decks have 1 1/2- and 1-in. square openings, respectively, and the lower deck has 1/2- and 1/4-in. square openings. Oversize from the top deck is chuted to a 3-ft. Symons cone crusher. After crushing, the product returns to the Simplicity screen via the bucket ele-

**Dust collection system
draws off dust from pri-
mary and secondary
crusher to agstone bins**

vator, thus forming a closed circuit. Oversize from the middle deck of the Simplicity screen goes to a combination surge and storage bin, which feeds the Jeffrey hammermill. Oversize from the bottom deck goes to storage while the throughs are sent to a 4-x 6-ft. Deister double-deck screen. This screen has 1/2- and 1/4-in. square openings on the upper and lower decks. Oversize from the two decks goes to separate storage bins while the throughs go to the agstone bin.

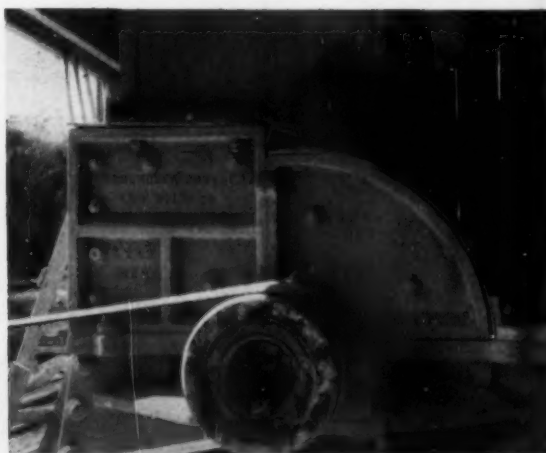
Stone taken from the surge bin is sent to the Jeffrey hammermill from which it is transported to agstone storage by a bucket elevator, 60-ft. centers. The 1 1/2-in. stone is taken from bins by chute and sent to the Gruendler pulverizer, from which it is also sent to agstone storage by a bucket elevator, 52 1/2-ft. centers.

The entire plant, with the exception of the Gruendler and Jeffrey hammermills, is powered by a 200-hp. Westinghouse electric motor. The Gruendler is direct-connected to a 125-hp. Triumph electric motor and the Jeffrey is direct-connected to a 150-hp. Westinghouse electric motor. A 150-hp. G.E. motor is maintained as an emergency motor to operate the plant or either of the hammermills with belt drive.

The storage bins, six in number, have a combined capacity of 400 tons. A spur track of the I.C.R.R. under the bins, allows car loading through bottom discharge chutes. Trucks are



Showing extensive workings of quarry face. Three benches are being worked



Left: Gyratory crusher in foreground with cone crusher in the background. Right: Hammermill crusher for production of agricultural limestone

also loaded by this method. This plant is equipped with a Fairbanks-Morse track loading scale. About 75 percent of the stone is transported by rail, the other 25 percent is sold to local purchasers who do their own hauling.

Dust Collector Recovers Fines for Agstone

A dust collection system, with pipes leading from the Allis-Chalmers gyratory and the Symons cone crushers to the agstone bins, reclaims dust and also keeps the air clean in the crushing room. A 3-ft. fan draws the dust through the pipes to the bins, through two collecting cones which feed into the bins.

Agstone is shipped within a radius of 200 miles. Customers are supplied through A.A.A. contracts as well as open accounts. About 70 percent of the agstone sales is through the A.A.A.

The Cerulean Stone Co. was purchased in April, 1944, by a new concern which has the following officers:

Mack Hopson, president; John L. Street, treasurer; Carter Adams, assistant treasurer and secretary, and L. D. Rorer, vice-president and superintendent.

Start Crushing Plant

CENTRAL CHEMICAL LIME CORPORATION, Harrisonburg, Va., started production operations last January at the Oranda, Va., plant, which was purchased two years ago from the National Gypsum Lime Co. Construction is under way on a pulverizing plant which should be in operation by April, 1945.

About 60 percent of production is flux stone, while the remaining 40 percent has been stockpiled for use in the pulverizing plant. Of this 40 percent, minus 5-in., the 2- to 5-in. size will be sold for hearth stone, while the size below 2-in. will be sent through the crushing plant. The finished product will be bagged and sold as mineral meal and lime dust, for use in dusting coal mines, for

phosphate filler, asphalt filler, and feed mix.

The pulverizing plant will be equipped with an 8-ft. Sturtevant air separator, a B77 Jr. Bradley pulverizer, a 14-in. Tel-smith jaw crusher, a primary crusher, a Howe belt conveyor system, a Gilday log washer, a rotary screen, and a No. 205F, St. Regis twin bagging system.

Present production of flux stone is about 40 tons per day. The pulverizing plant should increase total production to about 65 or 70 tons per day.

T. A. Kagarise is superintendent of the Oranda plant of the Central Chemical Lime Corporation.

County to Make Agstone

SHEBOYGAN COUNTY, Wisconsin, is planning to purchase 40 acres of quarry property at Glenbeulah, Wis., and to set up an agricultural limestone plant to supply requirements of farmers throughout the county and to furnish road construction materials.



To the left: Triple-deck vibrating screen which takes most of the screening load. To the right: Housing for 36-in. fan for dust collection and the pipes leading to collecting cones and thence into bins

By E. D. POWERS



Typical installation of a Cottrell electrical dust precipitator system in a cement plant

Control and Collection of Industrial Dust

Part 9: Electrical precipitation of dust

COLLECTION EFFICIENCY of an electrostatic precipitator is in general a question of economics. A guarantee of 99.9 percent collection efficiency of all dust particles entering the system irrespective of size can be obtained. The cost of the equipment is somewhat in proportion to the collection efficiency desired, and such high efficiency as mentioned above is rarely justified by the economies involved.

Dust particles of any size can be collected in an electrostatic precipitator but since most other types of equipment cost less, the electrical precipitators are usually used only for fume, mist and dust particles below 150 microns. Settling chambers, cyclones or other methods of dust collection are often used for preliminary cleaning.

Fig. 36 shows a diagrammatic arrangement of the electrostatic collector. The dust laden gas is shown entering at the bottom, passing up through the collecting tube and leaving near the top as clean gas where it can be discharged to atmosphere, returned to the building or carried on to the next step of the manufacturing process. The separation and collection of the dust particles is accomplished by passing the gas through a high potential unidirectional electrical field, between two oppositely charged electrodes. One of these

electrodes is usually grounded and called the collecting electrode, while the other, called the discharge and precipitating electrode is insulated from it and connected to a source of high potential. The dust particles are electrically charged and driven by the force of the electric field toward the collection electrode where they are deposited. The dust which has

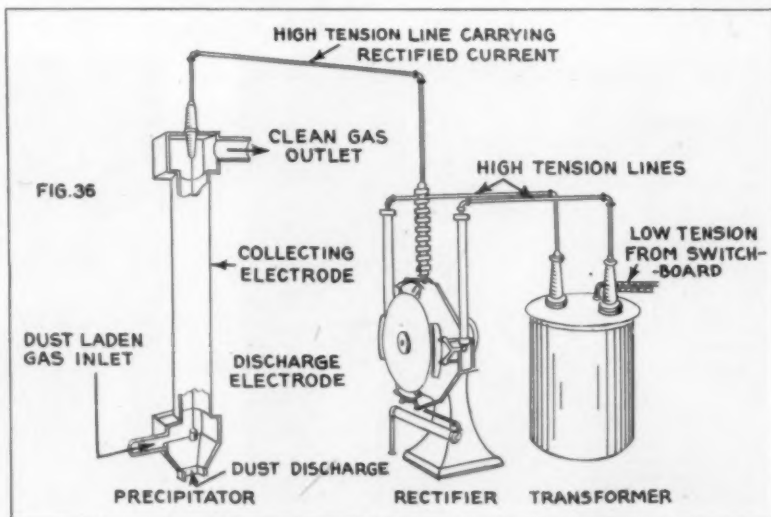
accumulated on the electrode is shaken to a bottom hopper or conveyor by a vibrating mechanism.

The electrical energy can come from any source of alternating supply. It is stepped up by a transformer to the required voltage, which may range anywhere from 7500 to 100,000 or more volts. The high voltage a.-c. current is rectified by means of a synchronous motor commutator or electron tube rectifiers. The current passes to one electrode from which it discharges through the gas stream to the other electrode which is grounded.

The type shown in Fig. 36 is made up of a group of vertical tubes or pipes 3 to 12 in. in diameter and 5 to 15 ft. high. Sometimes a series of parallel plates in a casing form the channels through which the gas flows. Discharge electrodes are suspended between the plates. There is a wide range of flexibility in this type of dust collecting equipment.

Gases up to 1400 deg. F. can be handled, as can gases of either neutral or highly corrosive character. While the precipitators are usually built of steel, corrosion or heat resistant materials can be used when required. Electrodes are sometimes made of concrete facing and the housing of brick or concrete. This collector can also be used for either dry solids or liquids in the form of mist. They can be built in units of 100 c.f.m. to 50,000 c.f.m. or more. The resistance through the collector is very low, usually a stack draft is sufficient. The power consumption varies but the most efficient may operate on as little as 10 k.w. per

(Continued on page 94)



Diagrammatic arrangement of an electrostatic dust collector

Vermiculite Insulation

UNDERGROUND PIPE LINES insulated with vermiculite insulating concrete afford triple waterproofing protection. The concrete is poured directly around the pipes. A 3-in. structural concrete base, or pad, is first placed at the bottom of a graded trench. Next, precast blocks of vermiculite concrete are placed at 10-in. intervals on the top of the concrete base, to support the pipes. The vermiculite concrete is poured around the pipes monolithically. Two plies of tar-saturated, 15 lb. asbestos felt are mopped into place with hot pitch, and this encases the insulation on all sides. This finishes the job, and the trench is ready for back-filling. There are no voids or joints to hold the water. In the last three years, 400,000 ft. of underground pipe insulation has been laid, despite the handicaps of war-time construction.

The post-war boom expected in locker plant and walk-in cooler construction will use plenty of vermiculite concrete. Its installation cost is low, and it has the added advantage of being rotproof, odorless and vermin-proof. It can be poured monolithically, or pre-cast into slabs. Where drying conditions are poor, or the refrigerated space must be put into service before the vermiculite concrete can dry out, the use of precast slabs is recommended. The recommended mix for roof or floor fill produces a concrete weighing about 22 lb. per cu. ft., having a compressive strength of 121 p.s.i. and a thermal conductivity of 0.60 B.t.u.

Vermiculite is a versatile mineral, and has other uses than as an ingredient in insulating concrete. The expanded size known as granular fill is marketed for home and building insulation. Another size, smaller than the concrete aggregate, is used to make acoustical plaster. Still another

is used as a spray-on anti-sweat coating. The Navy has been specifying the latter for the hulls of its new fighting ships. Vermiculite ground to a fine powder is used as a filler in paints, synthetic rubber, plastics and as an extender to bronze in lithography. All these uses offer excellent sales possibilities; but it seems likely that vermiculite will have its greatest market in concrete.

Quarry Air Raid Shelter

NEAR PARIS, FRANCE, is perhaps the largest single air raid shelter, a 400-year old limestone quarry and mine. The mine, used in pre-war days to grow mushrooms, is near the Renault automobile plant, and was converted to a shelter to accommodate 20,000 plant workers. Connected tunnels are 10 ft. high and are 50 miles in length.

Granite Crushing Plant

MORRISON-KNUDSEN, contractors, have started quarry operations 35 miles west of Cheyenne, Wyo., to furnish crushed granite to the Union Pacific for use as ballast. It is planned to load 25 carloads of crushed rock daily.

Light Weight Concrete

A REPORT by the National Bureau of Standards has revealed that the desirable properties of light weight aggregate concrete—low cost, light weight, heat insulation value, and low shrinkage upon drying—are in part sacrificed if the concrete contains more cement than that needed to meet an essential requirement, such as strength. Despite this, the concrete for buildings often contains about six sacks of cement per cubic yard, which usually is more than is needed to attain the properties desired for the hardened concrete, and more than the amount commonly

used for similar construction in Europe. The extra amount is added chiefly to improve the placeability of the concrete, thereby lowering the cost of placing and compacting, because leaner concretes are harsh and are not readily compacted.

Other methods of increasing the workability of lean concretes containing a light-weight burned-clay aggregate were investigated at the Bureau. Changes in the grading of the aggregate accomplished something, but a marked improvement was brought about by adding to the mixture a small amount of an organic compound that caused foaming during the mixing of the concrete and the entrainment of air. Concrete having only three sacks of cement per cubic yard had excellent workability when the entrained air was about 20 percent of the volume of the concrete. Such a concrete had a compressive strength of 500 p.s.i., which is sufficient for many uses, and possessed the other desirable properties associated with light-weight concrete.

Oklahoma Silica

A DESCRIPTION of the geological features of the Oklahoma silica sand region may be of interest. The glass sand deposit is of the Simpson group of the Ordovician Age, and the Oil Creek sand is the basal member of the group. The McLish formation overlies the Oil Creek and the sand which occurs at the base of this formation is used at the Mid-Continent Glass Sand Co. Sand from both of these formations has been found to be satisfactory for making container glassware and plate glass. Minerals that have been found in this formation are tourmaline, zircon, garnet, spinel, rutile, and epidote. However, these minerals represent only about 0.1 percent of the crude sand and are reduced to 0.025 percent in the processed sand. The bulk of the sand is quartz in the form of rounded, pitted, and frosted grains.

SIEVE ANALYSES OF GLASS SANDS IN CENTRAL ARBUCKLE MOUNTAINS—McLISH FORMATION

Operator: Mid-Continent Glass Sand Company, Roff, Oklahoma
Location: Section 18, Township 2 North, Range 5 East, Pontotoc County

Nature of Sample	Wt. of Sample Sieved (gms.)*	Tyler Sieve No.										Sieve Loss	Total %
		32	40	60	80	100	120	150	200	250	300		
Crude sand, upper 38 feet	86.0	0.495	0.351	0.246	0.177	0.124	0.088	0.051	0.035	0.024	0.002	0.2	100.1
Crude sand, lower 12 feet	94.9	0.0195	0.0138	0.0097	0.0069	0.0049	0.0035	0.0024	0.0015	0.001	0.0005	0.1	100.0
Plant run, washed, tumbled and dried	99.5	0.0195	0.0138	0.0097	0.0069	0.0049	0.0035	0.0024	0.0015	0.001	0.0005	0.2	100.0

CHEMICAL ANALYSIS—McLISH FORMATION

Nature of Sample (Date Sampled: Oct. 19, 1944)	SiO ₂	Al ₂ O ₃	Fe ₂ O ₃	CaO	MgO	H ₂ O† (-105°C.)	Loss on Ignition (+105°C.)	Total
Crude sand, upper 38 feet	98.39	0.75	0.26	0.06	0.007	0.14	0.32	99.927
Crude sand, lower 12 feet	97.82	1.16	0.40	0.16	0.003	0.23	0.49	100.25
Plant run (washed, tumbled, floated and dried)	99.83	0.054	0.044	0.02	0.004	0.004	0.09	100.042

*Percent (by weight).

†All samples dried in laboratory, after shipment from plant, to allow uniform splitting for sieve tests, chemical analysis, and heavy-mineral separations.

Eliminating Dust Hazard in Unloading Bulk Cement

By FRANK NEWTON*

SAFETY ENGINEERS for many years have realized that dust is injurious to the health of men who are required to work in dusty places. Since the day when men tied a handkerchief or cloth over their mouths and nostrils to try to prevent inhaling of dust until the present time there has been a continuous quest for some solution for this problem. Much research has been made on perfecting a respirator through which a man could breathe normally and at the same time eliminate poisonous gases and dust. Many of these respirators have been approved by the U. S. Bureau of Mines for use under certain conditions. So far a filter or cartridge type respirator has not been approved for use where there is carbon-monoxide fumes in the air or where there is a lack of oxygen. Neither can a filter type respirator be successfully used where there is little or no circulation of air.

The unloading of bulk cement from railroad cars is one of the places where there is little circulation of air and where a filter respirator is almost impossible for a man to wear for any length of time. The moisture of the breath and the cement dust in the air will soon clog any type of filter and render it useless. If a man continues to wear the respirator he does not breathe through the filter but rather from around the face piece. This was demonstrated very forcibly at one time when a man was using a filter type respirator and also tight fitting goggles. When he took the respirator and the goggles off, the area around the eyes which had been protected by the goggles was clean while the part of his face which was covered by the respirator was covered by cement dust which showed that he had not been breathing through the respirator but from around the mouthpiece.

All Unloading Methods Create Dusty Atmosphere

One of the least desirable jobs in the construction field is without a doubt the unloading of bulk cement from railroad cars. Usually a very small cost is allowed in the estimate for unloading cement which means that the man who is in charge of the

unloading has to move the cement as fast as possible regardless of the dust that it makes. The employer usually provides the employee some type of a filter respirator but it is left to the man unloading to decide to what extent he uses it. The man after he finds that he is unable to accomplish the work that is expected of him when he wears the respirator, discards it or hangs it on a nail where it will be convenient for him to put on if the boss comes around. When buying this respirator, the employer has been sold on the value of it to eliminate the dust hazard and he does not realize the difficulty that the employee has in wearing it when unloading cement, so the hazard is still there.

There are three general methods for unloading bulk cement. The first one used was a small hand-held scraper attached to a two-drum hoist operated similar to a slackline except that the scraper had to be pulled back into the car by hand. The next was the use of the cement pump. More recently the cement hog has come into use. All three of these methods have one hazard in common, a great amount of dust is created which causes difficulty in breathing by the man who is doing the unloading. It therefore became

necessary to find some means by which the men could be protected effectively while using this equipment.

Airline Respirator Solves Problem

As the most efficient means of eliminating this hazard, an airline respirator was decided upon. The airline respirator derives its name from the fact that the air that the wearer breathes is supplied to him from an air compressor through a hose to the mouthpiece which he wears. Between the source of the air and the mouth piece an air filter is installed to remove all traces of organic vapors and oils from the air. The amount of air supplied to the operator is controlled by means of a pressure reducing valve, and a gauge is also installed to show him the pressure which he is receiving. The wearer can adjust the amount of air he receives to his personal needs. Usually the gauge is set at 10 lb. pressure which allows for sufficient air to escape on each side of the man's nose to keep the dust out of his eyes.

The first installation of this kind was made where a cement pump was being used. Various makes of filter respirators had been tried and discarded by the man who was operating this cement pump. An air line respirator was installed and worked with complete satisfaction. The operator of the cement pump used the hose attached to his belt and was able to move around wherever he wanted to without any inconvenience.

The introduction of the cement hog has brought an added hazard to the unloading of cement; carbon-mon-

(Continued on page 94)



Operator of cement "hog" for unloading cement wears air line respirator to eliminate dust hazard

*Safety Engineer, Industrial Indemnity, San Francisco, Calif.

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ROCK PRODUCTS, July, 1945

Batching



Ready mixed concrete plant, showing bulk cement bin to the left and long conveyor for filling aggregate bins

Dunham-Price, Inc., has two ready mixed concrete plants in the Lake Charles, La., area, one serving the city proper and the other, a new industrial district which is expected to continue active in postwar era

By H. E. SWANSON

Ready Mix for War-Born Industries

MANY WAR PLANTS, retained as permanent structures for peacetime production, will require a considerable volume of concrete for maintenance purposes. This is particularly true in the area around Lake Charles, La., where several synthetic rubber and chemical plants have been built, the majority of which will remain in operation after the war is won.

With this post-war market in mind, Dunham-Price, Inc., erected a new ready mixed concrete plant in the heart of the industrial district, about five miles west of Lake Charles. In addition to the new unit, which

was completed late in 1944, this company operates in Lake Charles a dry batch ready mixed concrete plant and a concrete pipe plant. The Lake Charles plant, which has been in operation since 1938, will continue to supply concrete to local customers, while the new plant will primarily serve the large industrial plants.

Handling Aggregates

Sand and gravel aggregates are received by rail on the K.C.S.R.R. and are bottom dumped to a steel delivery hopper set in a concrete pit. The hopper feeds a 20-in. Atlas belt conveyor, 55-ft. centers, which carries the aggregate to a steel feeding hopper. A 20-in. Atlas belt conveyor, 226-ft. centers, installed at right angles to the first conveyor, carries the aggregate from the feeding hopper to a four-compartment Butler bin. This belt is on a 17 deg. incline and can handle 80 tons per hour. A swivel chute, controlled by a turntable on the ground, can be moved into position over any desired bin compartment. Three of the compartments handle aggregates and have a combined capacity of 150 cu. yd. while the fourth compartment with a capacity of 50 cu. yd. is for cement.

A 10-in. screw conveyor, 55-ft. centers, moves cement from a hopper under the spur track to a bucket elevator, 70 ft. high, which carries it to the cement compartment. When this compartment is full, the cement

is sent to a storage bin on the ground, having a capacity of 100 cu. yd. This bin feeds back into the screw conveyor.

Aggregates and cement are fed from the respective compartments to a 2-cu. yd. weigh batcher, equipped with Butler scales which weigh both the aggregates and cement.

Water is received from a well, 450 ft. deep, through a 4-in. well casing with a 1½-in. pipe. A Jacuzzi deep well pump, rated at 30 g.p.m., which employs the suction principle by use of a siphon jet at the bottom of the well, pumps the water to a 1000-gal. pressure tank. An electric switch pressure control keeps 70 p.s.i. pres-

(Continued on page 92)



Showing screw conveyor from car unloading hopper to bucket elevator. Overflow of cement in plant bin above is chuted back into auxiliary cement bin below. Same screw conveyor takes cement from this bin for elevation into plant bin



Close-up of plant mixer and diversionary chute to by-pass mixer for discharge into transit mixer trucks. Bucket elevator carries bulk cement from screw conveyor to bin, above



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INFORMATION

TO HELP YOU MEET TODAY'S PROBLEMS AND TO MAKE PLANS FOR TOMORROW

You can obtain catalogs listed on these pages by
merely checking and mailing the coupon below.

1 BALL BEARINGS—New Departure, Division of General Motors Corp., has released Part I and Part II of a series of three books dealing with the fundamentals of ball bearing design and application. The title of the first book, BA, is "Bearing Application," the second is "Details of Design" and the third, which has not yet been published, is entitled "Enclosure and Lubrication." Part I covers the fundamentals of bearing mounting, preloading methods, effect on housing fits, bearing creep, etc.

2 BATCHERS—Blaw-Knox Co. new 12-page booklet, Bulletin No. 2036, describes and illustrates various kinds of construction equipment such as weighing batchers, turntables, concrete buckets, clam-shell buckets, concrete paving spreaders, batching and mixing plants, etc. The bulletin contains tables, drawings, technical information, also capacity, weight and dimensions of various types of clam-shell buckets.

3 BIT DRESSERS—Bucyrus-Erie Co. has released a new 24-page bulletin, BD-2, describing and illustrating the No. 8 and No. 12 dressers for blast hole drill bits up to 6 1/2-in. dia. and 12-in. dia., respectively. Explanatory drawings and diagrams of shop layouts, photographs and descriptions of bit furnaces, quenching tanks, and bit handling cranes are also given.

4 DIESELS—Caterpillar Tractor Co. has issued a new booklet, Form 8932, describing and illustrating Diesels at work in mines and mills.

5 DUMP CARS—Pressed Steel Car Co., Inc., new Catalog No. 72-C describes and illustrates design and operating features of rolling trunnion automatic air dump cars in various types and sizes, with carrying capacities of 45,000- to 180,000-lb.

6 EXCAVATORS—The Jaeger Machine Co. has published Catalog JL-5, describing

and illustrating the "Fleet-Foot" loader-crane-excavator with 1/2 to 2-yd. buckets, which can be converted to a crane or loader in the field or for indoor work.

7 FEEDERS—Pioneer Engineering Works new bulletin, Form 557, describes and illustrates feeders, crushers, conveyors, idlers, screens, and sand dehydrators for mines, quarries and gravel pits. Sizes, dimensions and capacities are also given.

8 FORGING TERMS—Kropp Forge Co. has compiled a comprehensive list of forging terms with their correct definitions in a 20-page illustrated booklet entitled "Glossary of Forging Terms," to aid users and buyers of forgings toward a better knowledge of forging practice.

9 GRIZZLIES—Nordberg Mfg. Co. has issued Bulletin 121 describing and illustrating the Symons vibrating bar grizzly for scalping service where clear spacings of 2 1/2 in. and larger are permissible. It is 42 in. wide with a lengthwise opening of 5 ft. and a capacity up to 1000 tons per hour. Dimensional diagrams are also given.

10 HARDFACINGS—Resisto-Loy Co. has released Bulletin No. 7, describing and illustrating two-tone welding on heavy-duty power and earth moving equipment such as tractors, shovels, rock crushers, buckets and pumps. A 4-page folder giving description, type and applications, size and price of Isorod, Resisto-Loy and Tung-Alloy hardfacings has also been published.

11 HAULERS—The Euclid Road Machinery Co. has released a new catalog folder describing and illustrating the Model 27 FDT 20-ton bottom-dump Euclid coal hauler. This unit can also be used for high-speed off-the-highway hauling of other materials in industrial and mining applications.

12 HOSE—The B. F. Goodrich Co. has issued Catalog Section 4600, describing and illustrating six grades of suction hose for excavating and general utility service. Sizes, together with outside diameters and net weight in pounds per foot are given. Fittings are listed and described.

13 LINERS—Allis-Chalmers Mfg. Co. has published Bulletin B6355, containing questions and answers about the new A-C Lorain liner, which consists of lift-ers and liner plates in two separate units, permitting worn lifters to be reversed for additional wear before replacement. Typical applications of these liners are also included in the bulletin.

14 LOADERS—Athey Truss Wheel Co. has issued a new 6-page folder entitled "To Help You Maintain Better Highways" featuring the self-propelled force-feed loader. The folder illustrates time and labor saving methods of removing and salvaging surplus materials on highway maintenance and construction.

15 LUBRICATION—Sun Oil Co. has issued an interesting Technical Bulletin No. B-5 on the lubrication of industrial machinery, describing and illustrating types of bearings and gears, selection, application and purification of lubricants. A lubricating guide for anti-friction bearings is also included.

16 MIXERS—Chain Belt Co. new Bulletin No. 446 describes and illustrates REX concrete mixers ranging in size from 3 1/2- to 28-cu. ft. capacity. The bulletin also gives the operating features and specifications.

17 POWER—I-T-E Circuit Breaker Co. has published a new chart of standard electrical symbols for power, control and measurement, Bulletin 4403, for rapid reading of electrical diagrams. The bulletin contains more than 500 symbols and switch sequence tabulations quickly recognized by all users of wiring diagrams.

18 PULLEYS—The American Pulley Co. has released a new catalog, No. HT-44, describing and illustrating Hi-Torque motor pulleys. The catalog contains dimensions and list prices of standard sizes and complete price information for made-to-order pulleys.

19 PULVERIZED COAL—Kennedy-Van Saun Mfg. Corp. has released an interesting bulletin, 44-B, entitled "Radiant Heat from Air Floated Pulverized Coal," which describes and illustrates the application of pulverized coal to steam boilers, cement kilns, dryers, metallurgical and chemical work. Large size illustrations and typical applications of various units are also included in the bulletin.

20 SAFETY EQUIPMENT—Mine Safety Appliances Co. has published a 32-page handbook, Bulletin No. 493, describing and illustrating the proper care and maintenance of every type of safety equipment.

21 SCRAPERS—Woodridge Mfg. Co. has published Bulletin No. TA-425 describing and illustrating the Terra-Cobra self-propelled, heavy duty scraper. Operating features, specifications, etc., are also included in the bulletin.

22 SEPARATORS—Dings Magnetic Separator Co. has released an 8-page catalog, No. 11, describing and illustrating magnetic laboratory equipment available for mining, metallurgical and research laboratories. The catalog includes data on magnetic tube testers, wet-type, cross-belt, and induced-roll separators, and gives details on submitting samples to its laboratory for magnetic analysis.

23 TRANSMISSIONS—The American Pulley Co. has issued Bulletin SJ-44 describing and illustrating variable-speed transmissions. The bulletin also gives specifications and installation data on Speed-Jack drives.

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Tight, sturdy Multiwalls prevent losses caused by siftage or infestation. They also help to keep storerooms clean.



Because Multiwalls are easy to stack and handle, they save valuable loading and unloading time.



St. Regis Bag-packing Machines accurately preweigh a product and quickly pack it into Multiwall bags. This frequently means a saving of extra labor and equipment.

IN CANADA:

St. Regis Paper Co. (Can.) Ltd.
Montreal, Quebec
Vancouver, British Columbia

Worthington-Ransome Blue Brute Distributors

By referring to the advertisement on page 93, you'll learn the meaning of the (1), (2) or (1-2) beside their names.

Ala., Birmingham (1) J. D. Pittman Tractor Co.
Ariz., Phoenix (2) Smith Booth Usher Co.
Ark., Fort Smith (2) R. A. Young & Son
Little Rock (1) Kern-Limerick, Inc.
Little Rock (2) R. A. Young & Son
Calif., Los Angeles (1) Garlinghouse Bros.
Los Angeles (2) Smith Booth Usher Co.
San Francisco (2) Coast Equipment Co.
Colo., Denver (2) John N. Meade
Denver (1-2) Power Equipment Co.
Conn., Hartford (2) The Holmes-Talcott Co.
New Haven (1) W. L. Clark
Waterbury (1) Contractors Supply Co.
Del., Smyrna (1) King-Burrows
D. C., Washington (1) M. A. Doetsch Machinery Co.
Fla., Jacksonville (1) Julius P. Benjamin, Inc.
Tampa (2) S. M. Regan
Ga., Atlanta (2) Tractor & Machinery Co.
Savannah (1) Morgans, Inc.
Ida., Boise (1-2) Olson Manufacturing Co.
Ill., Chicago (1-2) Chicago Construction Equipment Co.
Chicago (2) John A. Roche
Chicago (2) Thomas Holst Co.
Ind., Fort Wayne (1) American Steel Supply Co.
Indianapolis (2) Reid-Holcomb Co.
Iowa, Des Moines (2) Electric Eng. & Const. Co.
Ky., Harlan (2) Hall Equipment Sales Co.
Louisville (2) T. S. Coleman & Son
Louisville (2) Williams Tractor Co.
Paducah (1) Henry A. Pettey Supply Co.
La., New Orleans (1) Ole K. Olson Co.
New Orleans (2) Wm. F. Surgi Equipment Co.
Maine, Portland (1-2) Maine Tractor Co.
Md., Baltimore (1) Stuart M. Christhill & Co.
Baltimore (2) D. C. Elphinstone, Inc.
Mass., Boston, Allston (1-2) Clark-Wilcox Co.
Cambridge (2) W. W. Field & Son, Inc.
Mich., Detroit (1) T. G. Abrams
Detroit (2) W. H. Anderson Co., Inc.
Flint (2) Granaden-Hall & Co.
Muskegon (1-2) Lakeshore Machinery & Supply Co.
Minn., Minneapolis (1-2) Phillips-Murphy Equip. Co.
St. Paul (2) D. L. O'Brien
Miss., Jackson (1) Jackson Road Equipment Co.
Mo., Clayton (1-2) The Howard Corporation
Kansas City (1) Brown-Strauss Corp.
Kansas City (2) Machinery & Supplies Co.
St. Louis (2) W. H. Reaver
Neb., Lincoln (1) Highway Equipment & Supply Co.
N. J., Hillside (2) P. A. Drobach
Newark (1) Johnson & Dealman
North Bergen (2) American Air Compressor Corp.
N. M., Albuquerque (2) Bud Fisher Co.
Albuquerque (1) Morrow & Co.
Roswell (2) Smith Machinery Co.
N. Y., Albany (1-2) Milton-Hale Machinery Co.
Buffalo (2) Dow & Co., Inc.
New York (2) Air Compressor Rental & Sales
New York (1-2) Hodge & Hammond, Inc.
New York (1-2) Railroad Materials Corporation
Olean (2) Freeborn Equipment Co.
N. C., Raleigh (1) Carolina Tractor & Equipment Co.
N. D., Fargo (1-2) Smith Commercial Body Works, Inc.
O., Cincinnati (2) Finn Equipment Co.
Cleveland (2) S. M. Clancey
Cleveland (1) H. B. Fuller Equipment Co.
Cleveland (2) Gibson-Stewart Co.
Marietta (2) Northwest Supply & Equipment Co.
Toledo (1) Edmund Supply Co.
Toledo (2) M. W. Kilcorse & Co.
Okla., Oklahoma City (2) Townaco Equipment Co.
Oregon, Portland (2) Andrews Equipment Service
Pa., Allentown (2) H. N. Crowder, Jr., Inc.
Easton (2) Sears & Bowers
Harrisburg (2) R. A. Coulter
Oil City (2) Freshboro Equipment Co.
Philadelphia (1) Giles & Ransome
Philadelphia (2) Metalweld, Inc.
Pittsburgh (2) Atlas Equipment Corp.
Wilkes-Barre (2) Ensminger & Co.
Wilkes-Barre (1) Arrow Supply Co.
York (2) George F. Motters Sons
S. C., Columbia (2) Smith Equipment Co.
Tenn., Knoxville (2) Wilson-Weesner-Wilkinson
Memphis (2) Tri-State Equipment Co.
Tex., Dallas (1) Service Equipment Co.
Dallas (2) Shaw Equipment Co.
El Paso (2) Equipment Supply Co.
El Paso (1) Mine and Smelter Supply Co.
Houston (2) Dye Welding Supply Co.
Houston (1) McCall Tractor & Equipment Co.
San Antonio (2) Patten Machinery Co.
San Antonio (1) San Antonio Machine & Supply Co.
Utah, Salt Lake City (1-2) Lander Engineering Co.
Vt., Barre (1-2) A. M. Flanders, Inc.
Va., Richmond (2) Highway Machinery & Supply Co.
Wash., Seattle (1) Columbia Equipment Co.
Seattle (2) Star Machinery Co.
Spokane (2) Andrews Equipment Service
Spokane (1) Columbia Equipment Co.
W. Va., Charleston (1) West Virginia Co.
Fairmont (2) Interstate Engineers & Constr., Inc.
Wis., Milwaukee (1) Mekeel Engineering Co.
Wyoming, Cheyenne (2) Wilson Equipment & Supply Co.

Blue Brute Distributors

Worthington Pump and Machinery Corp.
Worthington-Ransome Construction
Equipment Division
Holyoke, Massachusetts

Ready Mix

(Continued from page 88)

sure in the tank, which forces the water through a 2-in. pipe up to the mixing plant. The automatic switch is set to start a 3-hp. electric motor when the pressure in the tank falls to 25 p.s.i., which builds up the pressure until it reaches 70 p.s.i. at which point it shuts off.

Both Plant and Transit Mixed

Under the weigh batcher is a diversionary chute which allows dry batch discharge to transit mixers. When mixed concrete is desired, the weigh batcher discharges to a 56-S Ransome mixer. Water to the mixer is measured by a Neptune water meter.

Delivery of concrete is made by a fleet of nine Rex transit mixers, five high dump and four low dump, mounted on International and Ford chassis.

The reinforced concrete substructure, 23 ft. high, was erected on four reinforced concrete footings, 5- x 8-ft. x 20-in. thick. Each footing is supported by eight 30-ft. creosote-treated timber piles which have a bearing load of 15 tons each. The columns will support 110 tons each. The belt conveyor system is supported by steel framework set on concrete piers, the footings for which are 5 x 5 ft. and 12 in. thick.

Power for the plant is provided by U. S. motors. The first belt conveyor has a 20-hp. motor while the second, or longer, belt conveyor has a 35-hp. geared motor, which reduces the 1800 r.p.m. motor speed to 100 r.p.m. on the shaft. Mixer is driven by a 40-hp. motor, and the screw and elevators are operated with a 20-hp. motor.

Some of the war plants which this company serves are: Cities Service



One of a fleet of nine high dump mixer trucks

Refinery, Firestone Rubber Co., and Mathieson Alkali Works. Many of these will continue to operate after the war is over, which should assure a steady demand for ready mixed concrete.

The Lake Charles plant of Dunham-Price, Inc., in addition to ready mixed concrete, produces concrete pipe with two Tuercik-McKenzie pipe machines. One machine will make

pipe from 4 through 30 in. and the other will make sizes from 30 through 60 in. Ted F. Dunham, now a major in the U. S. Air Forces, is president of this company; C. A. Fenet is vice-president and general manager; and Mrs. Roland Price is secretary and treasurer. The new plant was constructed by the Western Construction Co., Inc., Lake Charles, La.

Agricultural Lime

(Continued from page 45)

tribution of anything. It is one thing if the program is to hold for the future, but manufacturers face an entirely different problem if they have to sell their goods in competition on their merits and accept all of the merchandising responsibilities that go with private distribution, such as research, development, advertising, promotional selling, etc. I am still one of those who believes that private industry can do the job if given the chance and also, that the great majority of American farmers are not seeking charity at the expense of the taxpayer."

Files Complaint

ELKHORN SAND CO., INC., Louisa, Ky., has filed a complaint with the Interstate Commerce Commission against six railroads charging excessive joint line haul charges and refusal to permit the Elkhorn Sand Co. to name the routes over which its product should be shipped, when the junction points designated have facilities for handling freight. The complaint also requests that the railroads stop the alleged violations of Secs. 1, 2 and 3 of the Interstate Commerce Act. Elkhorn Sand Co. also asks that rates for traction sand in carload lots be established on a uniform mileage basis. The roads mentioned in the complaint are the Chesapeake and Ohio Railway Co., Clinchfield Railroad Co., Interstate Railroad Co., Louisville and Nashville Railway Co., Norfolk and Western Railway Co., Southern Railway Co., and Virginia Railway Co.

Resume Operation

LONE JACK LIMESTONE CO., INC., Lynchburg, Va., suspended operations last December due to a shortage of help. However, it is planned to resume production sometime in 1945 if the W.L.B. reacts favorably to its application for man power. During the period of inactivity, a skeleton crew has been making repairs to plant equipment.

Furnish Rip-Rap

GEO. W. KERFORD QUARRY CO., Atchison, Kans., has opened up a quarry at Hill Top near Leavenworth, Kans., to produce stone for rip-rap work along the Missouri river at the north end of Sherman Field, Fort Leavenworth.

A NEW BLUE BRUTE FOR NEW ROCK-BUSTING JOBS



Enough crushed rock for today's needs plus those of the postwar future (like Pennsylvania's \$500,000,000 Postwar Highway Program) is an order that will take plenty of top-rate drilling.

Already Worthington's improved UMW Wagon Drill is keeping quarries hot with its speedy, powerful, easy drilling. It's the wagon drill you'll want for your new jobs — and, like other Blue Brute products, it's available today.

This 4" UMW-40 is the most versatile in the business. Drills holes in any direction and at any angle. U-arm may

*Reg. U. S. Pat. Off.

be swung in any position from vertical to 45° below horizontal. Two rear wheels may be turned through 90°, thus permitting line drilling close to a face. 6-foot nominal steel change.

Its many other advantages — plus the savings in maintenance cost you get with portable Blue Brute Compressors — the ones with the famous easy-breathing Feather* Valves — mean more air per compressed air dollar and more holes drilled per day.

Investigate Blue Brutes. Try 'em—buy 'em. Nearest distributor listed on page 92.

KNOW YOUR BLUE BRUTES

Your nearby Blue Brute distributor will gladly demonstrate how Worthington-Ransome pavers and other construction equipment will put your planning on a bid-winning basis and prove that *there's more worth in Worthington*. Act now! His name is listed on page 92. The number beside his name indicates the Blue Brutes he carries.

1

Blue Brutes include: Pavers, Concrete Spreaders,** Concrete Mixers, Concrete Placing Equipment, Big Mixers, Finishing Machines,** Pneumatic Placing and Grouting Equipment, Truck Mixers, Plaster and Bituminous Mixers, and Accessories.

2

Blue Brutes also include: Diesel, gasoline and electric driven Feather* Valve Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs; Rock Drills and Air Tools in a wide range of weights and sizes; Contractors' Pumps.**

*Reg. U. S. Pat. Off.

**Postwar Products.

Get more **WORTH** from air with **WORTHINGTON**

BUY BLUE BRUTES



Compressors from 60 to 500 cu. ft. capacity in mountings to suit all jobs. Rock Drills and Air Tools that have

always set the pace for easy operation — available in a wide range of weights and sizes.

WORTHINGTON KEEPING THE PACE

Worthington Pump and Machinery Corporation, Construction Equipment Department, Halyoke, Massachusetts

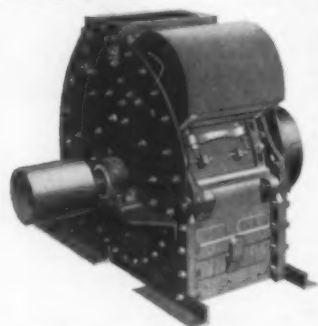
NEW HOLLAND

ADVANCEMENTS



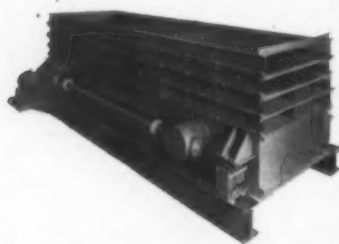
DOUBLE IMPELLER MODEL 3030 CRUSHER

Here is a primary and secondary crusher combined into one unit. Reduces run-of-the-quarry stone as large as 36" to an optional minimum of 80% minus 1" in one operation. Will produce from 100 to 150 tons per hour with as little as 100 hp. Lends itself admirably to portable as well as stationary units.



RUGGED INDUSTRIAL-TYPE LIMESTONE PULVERIZERS

Set up to produce agricultural limestone in large capacity economically. Install a N.H. No. 30 Impact Type Pulverizer after the Model 3030 Double Impeller Crusher.



N. H. HORIZONTAL VIBRATING SCREENS Have Superior Features. Designed for the Most Difficult Screening Jobs.

LET N.H. ENGINEERS PLAN YOUR SET UP FOR PRODUCING AGRICULTURAL LIMESTONE OR CRUSHED AGGREGATES. THE MOST ECONOMICAL WAY IS WITH THE MODEL 3030 AND OTHER N. H. EQUIPMENT.

Address NF-8

NEW HOLLAND MACHINE CO.

New Holland, Pennsylvania

Unloading Cement

(Continued from page 86)

oxide gas. The cement hog is a small portable machine with a small scoop across the front which is lowered to load and is in a raised position while transporting the cement to the car door where it is dumped into the chute. This machine is powered by a small gasoline engine whose exhaust contains carbon-monoxide gas. This has proven to be a very serious hazard as the efficiency of the operator of the cement hog is lowered on account of the absorption of the carbon-monoxide. It also affects the throat and eyes. Operators only would stay a few days and then would leave to seek other employment.

Hose Reel Permits Movement

When it was proposed to try the use of an airline respirator in connection with the cement hog, violent opposition was encountered from those in charge of the job. Their contention was that the men would not wear the air line respirators. Another thing was that the hose was too difficult to be taken care of as the hog had to shuttle back and forth in the car at a high rate of speed to get the cars unloaded in the specified time. In the meantime, acute cases of laryngitis developed along with some cases of serious eye infection. It became almost impossible to get any men to operate the hog. Finally the air line respirator was to be given a trial. To overcome the problem of the hose, a hose reel, similar to those used in many service stations and garages, was mounted on the cement hog dock outside the car door. The end of the hose which led to the mouth piece was attached to the back of the cement hog and enough of the hose was left so that the operator would be able to take the respirator off and on without detaching the hose from the cement hog. The cement hog then pulled the hose out of the reel as it moved into the car, and the reel retrieved the hose as the hog came back. This completely overcame the difficulty of the hose being run over by the hog or in any way becoming an inconvenience to the operation. It was planned to put a roller on the car door jam to prevent wear on the hose, but it was found that wear on the hose was so slight it was unnecessary. Although the reel works perfectly and makes a fine permanent installation, a counterweight, similar to those used by service stations for air and water service, could be used in place of the reel. In this case, the counterweight would be above ground instead of below ground level as in the case of service stations. It would probably be less expensive and just as satisfactory for a temporary field installation.

After the installation of the airline respirator to the cement hog,

the men operating the cement hogs were not affected by cement dust nor carbon-monoxide gas. The efficiency of the whole operation was speeded up. In fact it proved so successful that the man who first claimed that it was the height of stupidity to think of using an airline respirator on a cement hog was one of the greatest boosters for it when it got to working. He was completely sold on this method of unloading cement from both a health and efficiency of operation standpoint.

The hand-held scraper, although it was one of the first methods used, is fast passing out of the picture on account of the time it takes for unloading a car and the difficulty of getting men to perform the work. An airline respirator could easily be installed with this method of unloading by having the employee wear a belt with the hose attached to the belt and just enough weight on a counterweight to keep the hose tight and not enough to interfere with the operation of the scraper.

Experience has proven that an airline respirator can be used wherever there is heavy concentration of dust or obnoxious gas fumes present. Any employer who really wants to make an honest effort to eliminate the hazard of dust can do so by using a little ingenuity in installing an airline respirator regardless of what method is used for the unloading of dusty materials or where the working conditions render a filter respirator useless.

Dust Collection

(Continued from page 84)

100,000 c.f.m. of gas. Occasionally it is necessary to humidify the gases or to add electrically conducting materials in order to secure proper conductivity of the deposited dust, as otherwise it may be impossible to maintain the necessary voltage for proper precipitation.

This may be termed the most efficient type of dust collecting equipment for industrial use. The initial cost is high but when maximum recovery in the dry state is required, its use is justified.

Unite in Britain

THE LIME AND LIMESTONE FEDERATION of Great Britain has been organized to consolidate all lime and limestone associations in the British Isles. This federation of all lime and limestone groups has been carried forward as a means of presenting a united front in post-war activities.

Loading Dock Project

THE LOUISVILLE SAND & GRAVEL CO., Louisville, Ky., plans to construct a loading dock on the Ohio River near Westport, Ky. A large hopper and conveying and hoisting machinery will be installed.



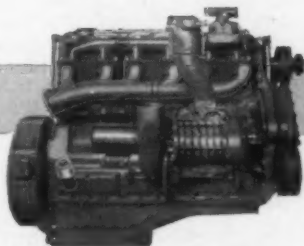
Of this... **SURE**

SURPLUS POWER IS PROTECTION . . . protection against the damaging shocks, jerks and strains that add to the abuse and shorten the life of powered earth moving and material handling equipment when there is barely "enough power" for *normal* requirements. *Surplus power* is protection, too, against lagging work cycles or accidents because reserve power is always available for peak loads or to meet any emergency.

For your wheel or crawler-mounted equipment or stationary applications, you can be sure of *surplus power* at the minimum cost in space and weight by

standardizing on Cummins Dependable Diesels. Three compact, low-weight-per-horsepower models—150, 200 and 275 hp.—have almost the same mounting dimensions and may be used interchangeably in many cases. All have the same basic design and incorporate a large percentage of the same parts. This assures a simplified service procedure and reduces the parts inventory . . . important points in holding down costs and increasing profits.

Have you carefully considered these advantages in specifying Cummins Diesels for your equipment?



Illustrated is the supercharged, 275 hp. Model NHS Cummins Diesel. In design, dimensions and weight it closely approaches the 150 hp. Model H and the 200 hp. Model NH. All are designed for automotive, portable and stationary power applications. Ask for specifications.



CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

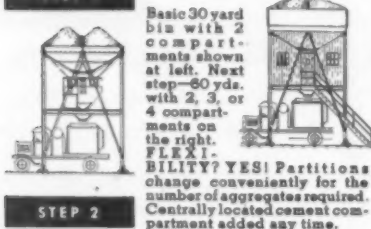
Build Your Batching Plant UNIT by UNIT

JOHNSON
WILL HELP YOU
MINIMIZE
THE
INVESTMENT



Investment riddles are solved by Johnson's "STEP-BY-STEP" Bins—No other investment with step-by-step plant built especially for those who want to keep their initial investment low but be ready to expand without loss if post war opportunity warrants. 30—60—120 yards as you need it. That's the step-by-step proposition.

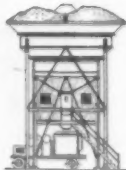
STEP 1



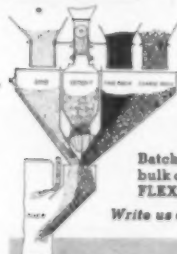
Basic 30 yard bin with 2 compartments shown at left. Next step—60 yds. with 2, 3, or 4 compartments on the right. FLEXIBILITY? YES! Partitions change conveniently for the number of aggregates required. Centrally located cement compartment added any time.

STEP 2

Here is the 120 yard plant, the one you will need when your contractors call for concrete in a hurry—quantity and quality. With this "STEP-BY-STEP" arrangement you cannot make a bad investment.



STEP 3



Of course the JOHNSON patented "CONCENTRIC AGGREGATE CEMENT BATCHER" is an integral part of any good batching plant. This batcher will use either bag or bulk cement with true efficiency. FLEXIBILITY? YES!

Write us or our distributors TODAY

THE C. S. JOHNSON COMPANY
Champaign, Illinois

Ready-Mix Plants. Bulk Cement Plants. Batchers. Cement and Aggregate Bins. Concrete and Cramshell Buckets. Cement Handling Equipment. Elevators and Conveyors.



Improved Lime Kiln

(Continued from page 76)

overburning during the later processing periods in the kiln is avoided by means of a specially fired finishing zone below the calcining zone.

As indicated in the illustration, the limestone passage is divided up into zones as follows: a preheating zone P; a dissociation zone D; a finishing zone F; and a cooling zone C. About at the end of zone D is a gas offtake pipe which extends across the shaft and has gas inlet openings on its under side. On one end it has an air inlet opening under control of an adjustable draft door for preventing overheating of the pipe and for supplying all the air needs of the gas producer. The pipe extends out on the opposite side of the shaft into communication with an induction fan which directs gases down a pipe system, comprising a waste pipe, a CO₂ process pipe, and a pipe leading to the gas producer.

The gas offtake pipe, previously mentioned, is substantially at the top of the dissociation zone D throughout which calcium dissociation occurs in the case of a high-calcium kiln. This zone fluctuates somewhat depending on kiln operation. In the case of a high-magnesium or dolomitic kiln, the upper part of the dissociation zone D becomes the magnesium-dissociation zone M, which is broad (from 5 to 8 ft.) and of low temperature (of the order of 1000 deg. F.). It is intended that the gas offtake pipe, while always at the top or above the high-calcium-dissociation zone, shall be near the top or within this broad band M of magnesium dissociation in a kiln in which magnesium dissociation occurs. For example, if the construction shown in the illustration were operated as a dolomitic kiln, the magnesium-dissociation region would be indicated at M and the high-calcium-dissociation region would be below this. Thus, in the case of the dolomitic kiln M would be the magnesium-dissociation region and D minus M would be the calcium-dissociation region, the latter being hotter than the former. If desired, the gas offtake pipe could be carried lower in the case of a dolomitic kiln but not below the bottom of the magnesium-dissociation region.

The lower end of the dissociation zone D for either high-calcium or dolomitic kilns is approximately at the upper firing passage of a vertical bridge wall which extends across the interior of the shaft. The finishing

zone F is between the upper firing passage in the bridge wall and a lower firing passage in this bridge wall. The cooling zone C is between the lower firing passage in the bridge wall and the outlet at the bottom of the hopper. Material which gravitates through the shaft divides and passes down on opposite sides of the transverse bridge wall.

A.S.T.M. Standards Book

AMERICAN SOCIETY FOR TESTING MATERIALS, Philadelphia, Penn., has announced that its complete, new 1944 Book of A.S.T.M. Standards, issued in three parts, is now available. Part I, Metals, contains standards governing ferrous and non-ferrous metals; Part II, Nonmetallic Materials, contains specifications involving cementitious materials, concrete and aggregates, masonry building units, ceramics, pipe and tile, and insulating materials; and Part III, Nonmetallic Materials, General, contains specifications covering fuels, electrical insulating materials, rubber, soaps, etc.

Purchase Quarry

SMITH BROS. CONSTRUCTION Co., Vancouver, Wash., has purchased the Fishers quarry from Kern & Kibbe Co. A crushing plant will be set up to supply jetty rock and other products.

Determination of Magnesia in Magnesite and Dolomite

PRODUCERS of cement, lime and crushed stone quite frequently wish to make an analysis of deposits. A method for determining the magnesia content of magnesites and dolomites by potentiometric titration, using a glass electrode, is described in the May, 1944, Analytical Edition of *Industrial and Engineering Chemistry*.

Excess acid present on dissolving the sample is neutralized with analytical reagent calcium carbonate. The titration is made in a hot 50 per cent solution of alcohol, with standard carbonate-free caustic. Weak bases such as iron, aluminum, and titanium normally present in magnesite and dolomite do not interfere. The method attains an accuracy which compares favorably with that of the ammonium phosphate procedure for magnesium and is much less time-consuming.

The following table shows the comparative results of the potentiometric and gravimetric results on samples of magnesite.

Sample No.	Magnesia Found		Total for Magnesite Analysis	
	Gravimetric %	Electrometric %	Gravimetric %	Electrometric %
1.....	46.10	46.19	99.00	99.69
2.....	45.90	46.37	99.30	99.77
3.....	46.20	46.13	100.04	99.97
4.....	46.40	46.34	99.70	99.84
5.....	46.10	46.13	99.90	99.93
6.....	46.10	46.25	99.90	100.05

SHORT-TRAVEL TUBULAR VALVE • WET OR DRY OPERATION • ENCLOSED CUSHIONED
RETAINER • SPEED PLUS POWER • 4 WEIGHT CLASSES • SIMPLE CONSTRUCTION •
LOW MAINTENANCE • ECONOMICAL OPERATION • AUTOMATIC LUBRICATION •
POSITIVE THROTTLE CONTROL • TIMELY BALANCED • STRONG BLOWING POWER •
POWERFUL ROTATION

**"I'm Hitting the Rock
for More Holes per Day"**

Operates All Day On Less Air



**Thor
Short-Travel
Tubular
Valve**



Basic reason for the air economy of Thor Sinker rock drills lies in the patented Thor valve and valve chest design. This enables Thor tools to utilize effectively ALL the air that enters the machine. Spaces between the valve flanges and the valve chest shoulders through which air enters are controlled to a tolerance of .00025 of an inch.

At left above: shoulder measures the exact amount of air needed to drive hammer on the power stroke. At right: measuring precisely the air for return stroke.

Measured air makes performance smooth and uniform.

Ask the man who runs one, and he will tell you there is something about Thor Sinker Rock Drills that allow long drilling periods without too much wear and tear on the operator. It's the work that gets done, not the operator. A combination of features makes this possible—ample power and speed, smooth control with a four position throttle and accurate balance in the design of the tool.

Thor tools are well made of the finest heat-treated steel and have a world-wide reputation for long dependable service. Besides, both operating cost and maintenance are very low. Standardize on the Thor line and settle sinker problems for years to come. Write for catalog 42A.

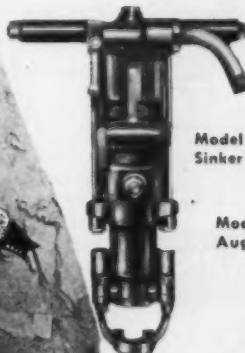
INDEPENDENT PNEUMATIC TOOL CO.

600 W. Jackson Blvd., Chicago 6, Ill.

New York

Los Angeles

A Complete Thor Line—16 Models in 6 Sizes



**Model 38-441b.
Sinker Rock Drill.**



**Model 39-441b.
Auger Rock Drill.**

Thor

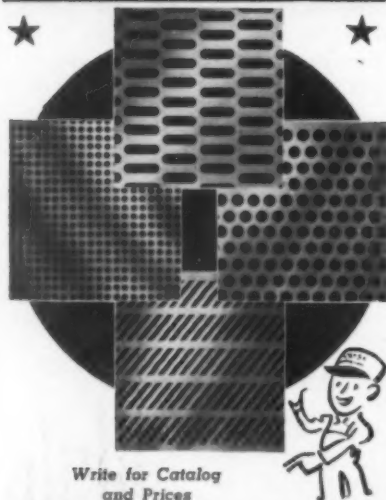
**PORTABLE
Electric & Pneumatic
TOOLS**



The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY
A. LESCHEN & SONS ROPE CO.
Established 1857
5909 Kennerly Avenue St. Louis, Mo.
New York — Chicago — Denver
San Francisco — Portland — Seattle

YOU CAN DEPEND ON
MAXIMUM SCREENING
EFFICIENCY with
**HARRINGTON & KING
PERFORATED METAL**



Harrington & King
PERFORATING CO.

5650 Fillmore St., Chicago 44, Ill.
114 Liberty St., New York 6, N. Y.

Industrial Sand Meeting

(Continued from page 69)

than the ordinary conditions to which workers are subjected.

Schooling Industrial Physicians

DR. RAYMOND HUSSEY, Dean, School of Occupational Health, Wayne University, Detroit, Mich., the only outside speaker on the program, spoke extemporaneously on the importance of industrial health in industry, and outlined the objectives of the new school he heads. A health program in an industrial establishment can be a profitable venture, he emphasized, in promoting plant efficiency and in reducing labor turnover.

Dr. Hussey resigned a colonelcy to accept his new post which has education in industrial health as its purpose. It is recognized that there is lack of knowledge of industrial diseases and the conditions for which workmen seek and secure compensation and that industry needs better physicians. Research will be one of the important functions of the new school.

Research

HAMILTON ALLPORT, chairman of the research committee, submitted the research organizational chart shown herewith, which is a work sheet for guidance of a post-war program for research. The principal objective of the committee has been to maintain a continuity of interest in research through the war period, in order to be prepared to conform with trends in the industries served as customers in the post-war period. President Matthews commented that research may comprise the heart of Association activities after the war.

STANTON WALKER, in his discussion of current technical problems, commented briefly on methods of determining A.F.A. clay content in bonded sands and the lack of conformity between specifications and use experience. He speculated on whether an end use specification might be better than one covering properties of the sand, percent of clay, etc., where permeability is the quality desired in a bonded sand. Mr. Walker discussed grading methods for foundry sands and possible changes in future methods for clay determination and methods of expressing gradation. He mentioned a new hydrometer test for the distribution of particle sizes throughout clay and which considers the clay particles in determination of the sand distribution. One proposal under study by the A.F.A. would be to express gradation as accumulative analyses through sieves and discard the A.F.A. fineness number determinations. Clay and sand would be considered together.

Mr. Walker mentioned a new activity, of commodity classifications,

which would specify sands not by use but by definite percentages of particles between successive sieves, which he said would bear watching. In concluding, he predicted that sometime in the future the Association will undertake a laboratory research program.

Re-employment

V. P. AHEARN emphasized that executives of member companies give serious consideration to the problem of re-employment of war veterans, which has become an increasingly live problem since V-E Day. He commented on the health status of returning veterans, and legislative trends in the direction of widening benefits for occupational diseases. Many returning veterans will need help in readjustment, he said, in urging the industry to do its utmost to provide useful jobs for them at decent wages. There will be pressure brought by returning veterans to secure jobs which in turn will bring pressure on politicians, he said, who will not continue to back a system that does not provide jobs.

Mr. Ahearn went into considerable detail on the legal obligations of industry to provide jobs for returning veterans. According to law, a war veteran is entitled to his former job or one of like seniority and pay, if his job was not temporary and he left to enter the armed forces after May 1, 1940, provided he had a satisfactory service record on his job and is still qualified to perform his job and that he applies for reinstatement within 90 days of his honorable discharge from service. It is assumed that his position was such that it would not be impossible to rehire him for his old job or for a similar job.

According to the Selective Service Law, a veteran is considered as being on leave of absence from his job while in service and he is entitled to insurance and other benefits without loss in seniority. He may not be discharged without cause for one year after his re-employment. Mr. Ahearn particularly emphasized that the Selective Service Law will prevail over union agreements in any disputes that may arise. It may be necessary to fire the man who replaced a veteran even if that man has seniority over the veteran; he said, in cautioning that unions will put up a fight. He said it may even become necessary to fire a veteran of World War I to make way for a returning veteran.

Priorities—Price Control

In discussing priorities for equipment, Mr. Ahearn said that W.P.B.

(Continued on page 101)

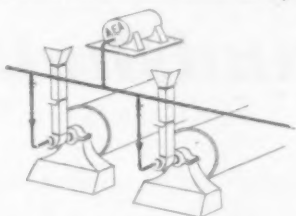
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Darex AEA is a development of over five years' research in our laboratories, backed by our fifteen years of field work with cement manufacturers in the use of TDA. Already over twenty mill runs and over a million barrels of air-entraining cement have been made with Darex AEA.

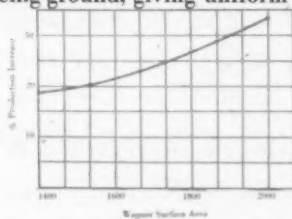
COMES READY TO USE AS RECEIVED

Darex AEA is a water-soluble compound that comes in convenient drums or tank-cars, ready to use as received. It is easy to use and absolutely safe—no mixing—no harsh chemicals—no extra safety precautions.



DAREX AEA IS A POWERFUL GRINDING AID

Based on our experience with TDA, the new Darex AEA is a powerful grinding aid which increases production and maintains a relatively uniform surface area in the cement being ground, giving uniform mill control.

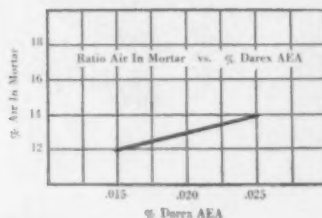


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Mill operators find Darex AEA inexpensive to use. Under average operating conditions, the increased mill production more than offsets any out-of-pocket cost of Darex AEA. Due to the catalyst in Darex AEA, it is not necessary to grind to a greater fineness to obtain strengths comparable to those of untreated cements.



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CAMBRIDGE 40, MASSACHUSETTS



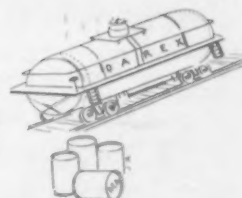
IT IS NOT SUPER-SENSITIVE

Darex AEA is not super-sensitive, as small variations in the amount used are not critical and do not greatly affect the air entrained.

Mill superintendents know that fluctuations in the feed of the clinker require an air-entraining agent added in a constant flow to have sufficient latitude so that it will not produce cements incorporating varying amounts of air. Repeated mill runs have shown that even under adverse conditions Darex AEA is not super-sensitive and gives controlled air in cement mortars.

READILY AVAILABLE

Shipped in convenient containers from 55-gallon drums to tank-cars, F.O.B. Chicago, Illinois. Ready to use.



From our experience to date, Darex AEA when added to the finish mill grind gives cements that incorporate uniform amounts of air. It is easy and safe to use. It has been declared acceptable by A.S.T.M. for cement specification C 175-44T. We don't claim that it is a cure-all, but believe it is worth your investigation. Why not make a mill grind and see for yourself what Darex AEA can do with your cement?

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The Pace of Victory Permits Only A Congratulatory Handshake!

American Industry well merits a decoration for its brilliant record in the Mighty 7th! But, as our newly decorated Pacific heroes quickly return to combat, so industrial leaders aren't resting on their laurels. **Back into Bond action**—they are now busy consolidating recent Payroll Savings Plan gains!

First, many executives are now patriotically working to retain the substantial number of new names recently enrolled during the 7th War Loan. By selective resolicitation, they are urging all new subscribers to maintain Bond buying allotments.

Second, many are also employing selective resolicitation to urge every worker who increased his or her subscription in the 7th to continue on this wise, saving-more-for-the-future basis.

Help to curb inflationary pressures and harvest peacetime prosperity by holding the number of Payroll Savings Plan subscribers—and amounts of individual subscriptions—to the mark set in the Mighty 7th!

The Treasury Department acknowledges with appreciation the publication of this message by

ROCK PRODUCTS

★ This is an official U.S. Treasury advertisement prepared under the auspices of Treasury Department and War Advertising Council ★

Industrial Sand

(Continued from page 98)

1319 applications for expenditures exceeding \$500 should be routed through the Washington office. There is a willingness on the part of W.P.B. to assist in capital installations since V-E day, he said, whereas replacement was the criterion before. Now is the time to make application for capital investment, he advised. Some items of capital equipment, particularly power shovels, tractors, cranes and draglines, will continue to be hard to get while the Japanese war continues. Order L192 was recently changed for the better, said Mr. Ahearn, and no longer requires any procedure for the procurement of repair parts.

The situation with respect to trucks will get much better and Mr. Ahearn suggested that applications for needed trucks be made early to the nearest O.D.T. office. Truck repair parts also will become easier to secure. However, cautioned Mr. Ahearn, there is little hope for early relief in securing truck tires and it will be necessary to conserve tires to the utmost. In the discussion following, a member said that his local O.D.T. office turned down his application for replacement trucks because units of larger capacity than those worn out were sought. The manpower shortage was his reason for desiring larger capacity trucks.

In commenting on price controls, Mr. Ahearn said there are no new developments. He warned that in the case of a new plant established since March, 1942, approval of prices to be charged must be secured under MPR 188. Also, prices for new products must be approved.

In Mr. Ahearn's opinion, there is no immediate prospect for products of the industry to be removed from the list of price-controlled commodities, at least not before V-J Day. He believes price controls may be in effect after the war is ended and that price controls will last for two years. The criterion for securing price relief is if it can be shown that a shortage in materials will result that adversely affects the public interest.

Considerable discussion on price relief developed. According to Mr. Ahearn, in giving an example, if a company has four plants operating at a profit and a fifth operating in the red, making it necessary to close the fifth plant, a price adjustment upward to enable that plant to break even may be secured if it is to the public interest that that plant be operated. In the event a company is suffering a loss in one of its plants, he said, in reply to a question, the company could refuse to sell a customer if it desired to do so. In reply to another question, Mr. Ahearn said that O.P.A. has no jurisdiction in prices when materials are shipped to Canada, but the Dumping Act would

(Continued on page 102)

NO CLOGGED NOZZLES



From an Arkansas gravel dredge operator—

"Formerly oversize rock would cluster around our suction pipe, and we would have to raise the pipe and cut our motor out, so as to allow these rocks to fall off. This often had to be done from twenty to thirty times a day, but is now (since installing an Eagle 'Swintek' Ladder) a thing of the past."

The above excerpt from a letter written by the superintendent of an Arkansas gravel company tells in a few words one of the reasons why progressive dredge operators are turning to Eagle "Swintek" Ladders.

Eagle "Swintek" Ladders have many other features that enable them to get out more aggregate at lower costs. They go

deeper for the desirable lower level gravels. The cutters on the traveling chain loosen gravel, carry away boulders and agitate the loosened material, thus increasing the intake of solids by the suction nozzle.

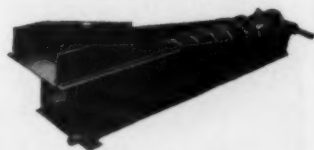
Write us about your dredging problem. Our engineers will be glad to offer suggestions on increasing your output and reducing your cost per yard.

Let an
Eagle
"feather
your nest!"

*Eagle Screw Washers,
Log Washers,
Dehydrators, Classifiers*

30 to 180 tons per hour capacity. Soundly designed modern drives. Features that insure cleaner sand and maximum production. Send for Bulletin 44.

EAGLE IRON WORKS
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EAGLE Specialized Sand and Gravel Equipment
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS
CLASSIFIERS — REVOLVING SCREENS



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Order CINCINNATI Conveyor or Elevator
Belting for outstanding service in your plant.

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Distributors throughout the U. S. A.

Industrial Sand

(Continued from page 101)

apply if prices are charged lower than those prevailing in the United States.

Car Supply

The car supply has been very short since December, 1944, and is expected to be critical for the next 12 months. Heavy movements in grain, unfavorable weather conditions, along with the greatest freight movement in history plus the fact that much railroad equipment is worn out have combined to create shortages in cars seriously affecting the industry. A roundup of members at the convention was taken to arrive at the exact status of car supply. Approximately half the members reported no serious shortages to date and the rest reported shortages in box cars, which are becoming critical in several sections of the country. In some cases shortages up to 30 percent have been experienced for several months. One plant in New Jersey which normally has ten box cars per day had only 30 available over a 23 day period. Condition of cars is generally bad.

Manpower

In a discussion of manpower problems, one member reported that a man in his plant (an essential plant) was granted a certificate of availability, without his approval, through the local U.S.E.S. in order to take a job in the coal industry which would pay the man higher rates. Another member said that his company had tried to recruit five men from another State and as a result was threatened with loss of all its employment rights.

Renegotiation—Surplus Equipment

Insofar as renegotiation is concerned, Mr. Ahearn said an industry member can only be liable if the operation of his plant is part of some other business subject to renegotiation. The Walsh-Healey Law would apply infrequently, in cases such as a direct contract with the Navy that exceeds \$10,000.

Surplus property disposal thus far has not involved much of interest to the industry, said Mr. Ahearn, and such equipment can only be secured through established dealers. He mentioned the sad experience of a sand and gravel producer who purchased a crusher for 85 percent of the original price. The crusher had to be rehabilitated at considerable expense and delay.

Owner-Drivers

There has been a shift in the position of the Bureau of Internal Revenue, said Mr. Ahearn, toward the idea that owner-drivers are contractors and not employees. If they are regarded as employees, the company must pay social security and wage and hour payments. If they are

classed as contractors, somebody must pay the 3 percent transportation tax on trucks for hire. If a delivered price is quoted, the producer must pay the transportation tax; if a plant price was quoted the customer should pay the tax. Mr. Ahearn believes the transportation tax will be one of the first wartime levies to be dropped.

In the matter of whether owner-drivers are classed as employees or contractors, he warned that doubt cannot be allowed to accumulate. Social security has been payable since 1936 and 6 percent interest on back payments would amount to considerable penalty. If a worker is subject to complete control of the company, such as in matters of keeping hours, wearing uniforms, signs, etc., likely would be considered as an employee. If the driver is asked to do anything but drive the truck, for instance to work around the plant, the chances are he will not be considered a contractor.

Wage-Hour Law

One requirement to compliance with the Wage-Hour Law is the maintenance of proper records, advised Mr. Ahearn. If a man does more than 20 percent of his work in non-exempted work, that man is not exempted, even if he is paid a salary. An example given was a case where the treasurer of a company did book-keeping work and was ruled subject to the law despite the fact he drew a substantial salary.

The convention concluded with a discussion of union contracts and experiences. The industry now has seven unions represented in its plants. From experiences cited, it is concluded that industry will be the victim of considerable warfare between the A.F. of L. and the C.I.O. after the war in the matter of jurisdiction over workers.

Registration

V. P. Ahearn, National Industrial Sand Association, Washington, D. C.
Hamilton Allport, Standard Silica Corp., Chicago, Ill.

Earle T. Andrews, Pennsylvania Glass Sand Corp., Mt. Union, Penn.

James B. Berge, Pioneer Silica Products Co., St. Louis, Mo.

N. C. Bos, Producer's Core Sand Corp., Michigan City, Ind., and John N. Bos Sand Co., Chicago, Ill.

J. S. Cable, Minnesota Mining & Manufacturing Co., Akron, Ohio.

J. J. Cleary, Sand Products Co., Cleveland, Ohio.

J. S. Coxey, Jr., Industrial Silica Corp., Youngstown, Ohio.

David L. Craig, South Jersey Sand Co., Dividing Creek, N. J.

John D. Cronenweth, Great Lakes Foundry Sand Co., Detroit, Mich.

E. H. Dougherty, Taggart & Co., Philadelphia, Penn.

Louis Dill, George F. Pettinos, Inc., Philadelphia, Penn.

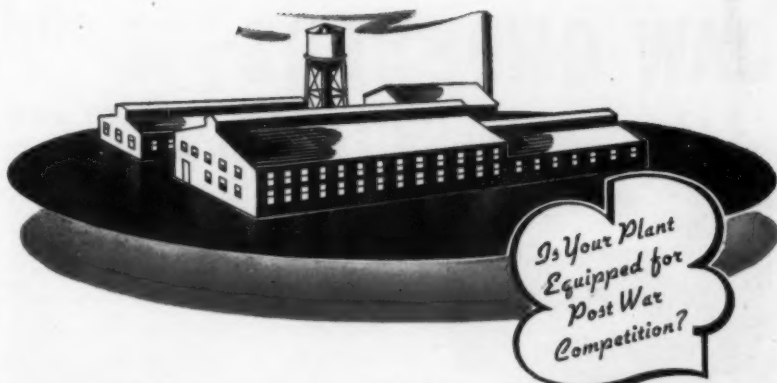
E. M. Durstine, Keener Sand & Clay Co., Columbus, Ohio.

A. N. Farmer, Sand Products Corp., Cleveland, Ohio.

Sterling N. Farmer, Sand Products Corp., Cleveland, Ohio.

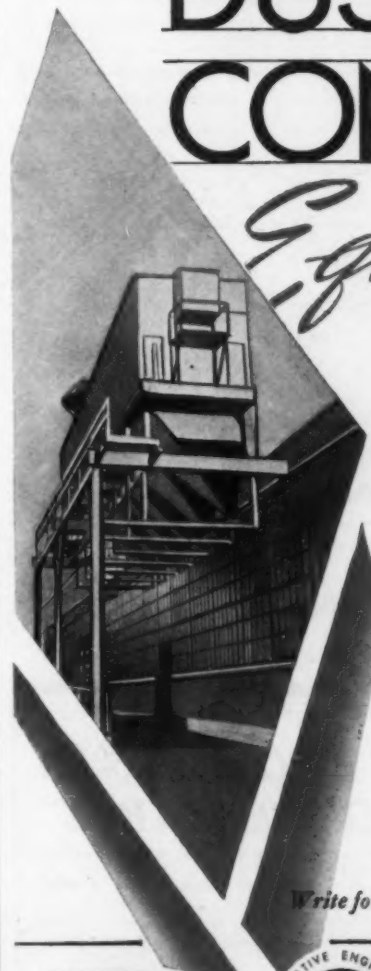
P. G. Forman, Industrial Silica Corp., Youngstown, Ohio.

(Continued on page 104)



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Equipped for
Post War
Competition?

Parsons Oval Bag DUST CONTROL Equipment



- SPEEDS UP PRODUCTION
- REDUCES MAINTENANCE
- INCREASES EFFICIENCY

To meet the keen competition of the post war period, far sighted executives are streamlining their factories for greater, more efficient production. Number one on their list is dirt and dust control. The answer is Parsons Oval Bag dust arrestors, backed by over 25 years of creative engineering and experience gained from installations everywhere. Dirt and dust are a menace to employees—slow down production . . . and deteriorate equipment. You can reclaim valuable dust, increase your production and employee efficiency with Parsons Oval Bag dust arrestors . . . our engineers will check your dust problem without obligation.

Write for our Bulletin . . . "Mastery of the Air"

Parsons

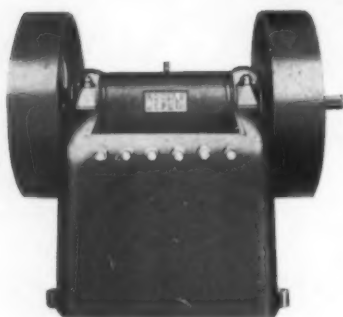


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15" x 36" Jaw Crusher
(Roller Bearings)

Portable Dual Quarry Plant
—A high capacity quarry
plant with simple sturdy
design and with a record for
low maintenance and produc-
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Submit your crushing problems. Write for descriptive bulletins.

ROGERS IRON WORKS CO.
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ABSOLUTELY INDISPENSABLE"

—Writes a Seattle, Wash., reader

• And so the story goes: From all over
the country busy, successful men take
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They know the value of ROCK PRODUCTS

—It is filled with ideas having a cash
return value. Most successful men in the
industry are, and have long been, ROCK
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The superiority of the long crusher jaw over the short jaw is well-known and recognized. All 16 sizes of Rogers Jaw Crushers are designed to a ratio of jaw length for jaw opening that keeps the included angle of the jaws within the limits that are known to be practical for the best results under any and all conditions.

This is just one of the many characteristics which make Rogers Jaw Crushers best for the toughest reductions in any desired capacity from 92 tph at 3" to 173 tph at 8".

The result of Rogers thoroughness and correct designing is durability and reliability unmatched in any other jaw crusher.

QUARRY PLANTS • GRAVEL PLANTS • JAW
CRUSHERS • ROLL CRUSHERS • BELT CON-
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C. Bryant Hartmann, George W. Bryant
Core Sands, McConnellsville, N. Y.
Russell G. Hay, The Ayers Mineral Co.,
Zanesville, Ohio.
T. C. Matthews, Pennsylvania Glass
Sand Corp., Lewistown, Penn.
Alfred J. Miller, Whitehead Brothers
Co., New York, N. Y.
W. J. Muhltner, Great Lakes Foundry
Sand Co., Detroit, Mich.
B. Nordberg, Rock Products, Chicago,
Ill.
Stanley A. Phillips, Pit and Quarry,
Chicago, Ill.
John T. Putnam National Silica Co.,
Oregon, Ill.
Arthur B. Schlesinger, New Jersey
Pulverizing Co., New York, N. Y.
E. O. Schneider, Ottawa Silica Co., Ot-
tawa, Ill.
W. Sherratt, South Jersey Sand Co.,
Dividing Creek, N. J.
Harry F. Spier, New Jersey Pulveriz-
ing Co., New York, N. Y.
Julius M. Strouss, Decker's Creek Sand
Co., Morgantown, W. Va.
A. H. Tanzer, New Jersey Pulverizing
Co., New York, N. Y.
Stanton Walker, National Industrial
Sand Assn., Washington, D. C.
A. Warsaw, Wedron Silica Co., Chicago,
Ill.
Theodore C. Waters, Baltimore, Md.
Norman B. Wild, Crossman Co., South
Amboy, N. J.
Howard J. Williams, New Jersey Silica
Sand Co., Millville, N. J.
W. A. Wilson, Pit and Quarry, Chicago,
Ill.
W. H. Woodward, Ottawa Silica Co.,
Ottawa, Ill.
C. L. Wolf, New Jersey Silica Sand Co.,
National Pulverizing Co., Millville, N. J.
C. Franklin Wolf, New Jersey Silica
Sand Co., Millville, N. J.

Contract Awards

SEVERAL fairly large Wisconsin
Highway Commission contract awards
have been placed recently which show
the trend in aggregates prices. Some
typical awards follow: Koepke Sand
& Gravel Co., Appleton, Wis., received
the contract for supplying 13,200 cu.
yd. of gravel for surfacing shoulders
on the Green Bay-Shawano Road, at
a figure of \$21,780; also 18,000 cu. yd.
for the Appleton-Waupaca Road, at
\$22,860. H. Turner & Son, Boscobel,
Wis., was awarded the contract for
33,000 cu. yd. of crushed stone sur-
facing for \$55,110 for the Boscobel-
Readstown Road. Ernest Jenkins,
Cobb, Wis., was given the award for
16,200 cu. yd. of crushed stone sur-
facing for the Argyle-Darlington
Road at a cost of \$26,568.

Blasting Disturbs Cows

KASER CONSTRUCTION Co., which
has been operating a quarry south
of Springfield, Mo., has been sued
for \$4585 by a dairy farm owner,
alleging that the blasting operations
reduced the flow of milk from his
herd of dairy cows to the point where
he had to sell the cows. Damage to
his home also was alleged.

To Build Ready Mix Plant

VALLEY READY MIX CONCRETE Co.,
Harlingen, Texas, will construct a
ready mixed concrete plant at Mc-
Allen, Texas. Hill Cocke is president
of the company.

Mineral Wool in 1944

MINERAL WOOL production in 1944, as reported by producers to the Bureau of Mines, reached 568,296 short tons valued at \$54,482,796, an increase of \$10,812,086 in value and 16,772 tons in quantity over the 1943 total. The production of home and industrial insulation increased, but the greatest change occurred in the industrial field.

The Bureau of Mines predicts that the postwar market for mineral wool insulation will be strong. However, with the increased use of lightweight glass insulation more emphasis will be placed on the density per cubic foot of the finished product. Because of the bulk of most mineral wool products, which prohibits haulage over great distances, prices are controlled largely by local conditions, and it is difficult to make an estimate of price conditions for the industry as a whole.

It is believed, however, that postwar prices for loose and granulated mineral wool, f.o.b. plant, will approximate respectively the 1943 figure.

Comparison of the production figures for 1943 and 1944 show that the total for 1943 was 551,524 tons as compared to 568,296 tons in 1944. The total tonnage in 1943 for home insulation was 422,773 as compared to 434,480 in 1944. For industrial insulation tonnage increased from 128,751 in 1943 to 133,816 in 1944. For home insulation, loose wool dropped from 62,978 tons in 1943 to 59,787 tons in 1944; granulated wool increased from 277,833 to 308,441; bats dropped from 56,737 to 52,007; rolls dropped from 10,117 to 6,394; felt dropped from 6,781 to 4,683; blocks from 453 to nothing; mineral wool insulating cement from 3,434 to 1,823; blankets from 402 to 1; pipe covering dropped from 11 to nothing; and others dropped from 4,029 to 1,344 short tons. Thus the total increase from 1943 to 1944 in home insulation wool came in the granulated wool.

Increases in industrial insulation tonnage were shown in bats which increased from 3,416 to 7,446; rolls which jumped from 65 to 565; felt, from 34,764 to 38,998; blocks, from 11,068 to 14,663; and boards which went from 26,003 to 36,728 short tons. Decreases in tonnage occurred in loose wool which went from 6,600 to 5,410; granulated wool, from 6,704 to 5,178; mineral wool insulating cement from 18,839 to 10,695; blankets from 9,111 to 7,353; pipe covering from 6,875 to 5,240; and others from 5,306 to 1,570.

"Sugar Stone" Quarry

CHARLES B. TAYLOR, Paso Robles, Calif., has reopened a limestone quarry near here which will be equipped to triple its former production. Demand comes principally from the sugar refining industry. The quarry has been shut down for two years due to ill health of the owner.



Noted for trouble-free operation

• This cutaway view of a Carver Certified Pump shows why it has such a record for high, lasting performance. Note the smooth, unimpeded flow of water from suction to discharge, the scientific design of the recirculation tube. Exhaustive performance tests helped determine exactly the proper size, shape and angle of this vital part to provide fastest priming, peak efficiency and correct amount of recirculation to keep priming chamber free from clogging deposits of silt, sand or dirt. See your local Carver distributor for specifications or write direct.

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Buying A Truck Mixer?



If you are planning a new truck mixer now or later . . . you'll want to investigate the special features that a Rex Moto-Mixer offers you.

You'll want to know about the exclusive Rex Chain Belt Drive that "cushions" road shock and protects the transmission, power plant and other vital working parts of a Rex Moto-Mixer.

You'll want to know about the Hi-Lo mixing action that makes mixing faster and more efficient—the patented method of water entry that introduces water behind the blades, right where the actual mixing takes place—the special Rex

Water System that allows water to be drawn off in any quantity desired, on all sizes of mixers—and the unrestricted discharge for all slump concrete.

Rex Hi-Discharge Moto-Mixers have been consistently improved, but the basic design has remained unchanged because it was *right*—from the start.

For complete information see your Rex Distributor or write Chain Belt Company, 1649 West Bruce St., Milwaukee 4, Wisconsin.

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Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants.

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FINANCIAL

RECENT DIVIDENDS

Alpha Portland Cement Co.	25 Sept. 10
Arundel Corp.	25 June 5
Basic Refractories	10 June 15
Dolese & Shepard Co.	1.50 July 2
Ideal Cement Co.	25 June 30
Longhorn Portland Cement Co. 5% Ptc. Pfd. (p100)	25 June 1
Missouri Portland Cement Co. (p25)	25 June 30
Peerless Cement Corp.	25 June 5
Pennsylvania Glass Sand Corp.	25 July 1
Pennsylvania Glass Sand Corp. pfd.	1.25 July 1
Riverside Cement Co. 1st pfd.	1.25 Aug. 1
Superior Portland Cement, Inc. \$3.30 A	.82½ June 30

MINNESOTA MINING & MANUFACTURING Co., St. Paul, Minn., voted on May 25 to increase authorized no par shares of capital stock from 1,000,000 to 1,500,000 shares. There are now 975,000 shares outstanding.

LEHIGH PORTLAND CEMENT Co., Allentown, Penn., has announced that approximately 98 percent of the formerly outstanding 56,741 shares of 4% convertible preferred stock were converted into common on the basis of four common shares for each preferred share through May 21, when conversion privilege expired, resulting in the issuance of more than 220,000 additional common shares. Remaining preferred shares were redeemed as of June 1 at \$110 per share and accrued dividends.

BESSEMER LIMESTONE & CEMENT Co., Youngstown, Ohio, reports the following income account for the years ended December 31:

	1944	1943
Net sales, etc.	\$2,011,947	\$1,969,350
Costs & expenses	1,555,828	1,618,812
Depreciation & depletion	241,458	215,360
Oper. income	214,661	165,178
Other income	25,182	32,001
Total income	239,843	197,179
Interest	2,128	4,008
Fed. inc. tax, etc.	112,000	98,000
Post-war tax cred.		cr 264
Net income	125,714	95,435
Preferred divs.	74,943	74,943
Common divs.	37,401	37,401
Surp. for year	13,370	d 16,909
Earn. surp., 1-1	338,993	371,914
Adjustments	dr 25	16,012
Earn. surp., 12-31	352,338	338,993
Earn., pfd. share	\$5.03	\$3.82
Earn., com. share	0.34	0.14
No. of pfd. shares	24,981	24,981
No. of com. shares	149,604	149,583

MATERIAL SERVICE CORPORATION, Chicago, Ill., reported net sales of \$9,470,607 for the year ended December 31, 1944; cost of sales was \$7,669,961 in 1944, and gross profit from sales was \$1,800,646. Other operating income was \$314,319. After deducting selling and general expense, the income was \$1,024,831. Net after taxes and dividends was \$670,728. Provision for postwar contingencies was \$500,000.

UNITED STATES GYPSUM Co., Chicago, Ill., reported net sales of \$62,329,573 for the year ended December 31, 1944, as compared with \$47,656,880 for the calendar year 1943, according to statistics supplied by S.E.C. reports. Other financial details of the report appeared in ROCK PRODUCTS for June, 1945, p. 116.

AMERICAN AGGREGATES CORPORATION, Greenville, Ohio, presented the following consolidated income account for the years ended December 31:

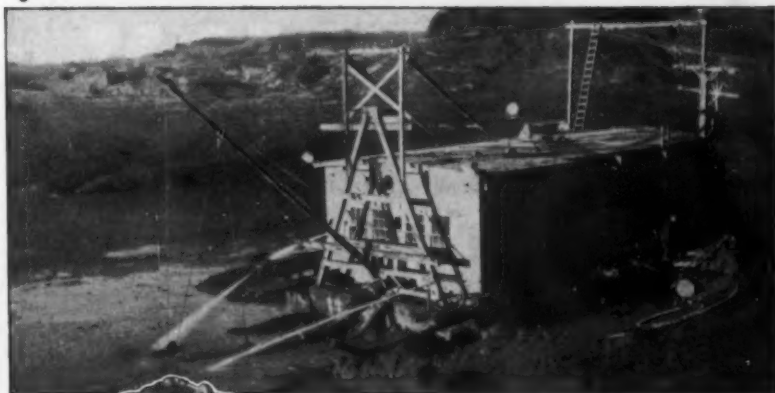
	1944	1943
Net sales	\$2,000,576	\$2,446,474
Cost of sales	1,483,295	1,595,529
Gross profit	517,281	850,945
Allied oper. inc.	386,001	156,964
Total	903,282	1,007,909
Selling, etc., expense.	255,752	223,793
Depreciation & Depletion	221,896	244,426
Emerg. fac. amort. ...	77,567	74,737
Net earnings	348,068	464,953
Other income, net	17,673	51,367
Total income	365,741	516,320
Fed. income tax	89,341	289,600
Conting. reserve	100,000
Net income	176,399	226,719
Preferred divs.	87,855	87,750
Common divs.	93,783	93,763
Surplus for year	24,761	75,206
Earned surplus, 1-1 ..	964,420	789,214
Fed. inc. tax res.	cr 100,000
Earned surplus, 12-31	989,181	964,420
Earned, pfd. share ..	\$15.27	\$19.63
Earned, com. share ..	0.63	0.90
No. of pfd. shares ...	11,550	11,550
No. of com. shares ...	187,626	187,626

MARBLEHEAD LIME Co., Chicago, Ill., is calling its 1st 4½s, 1954 (ext.) for payment on July 1.

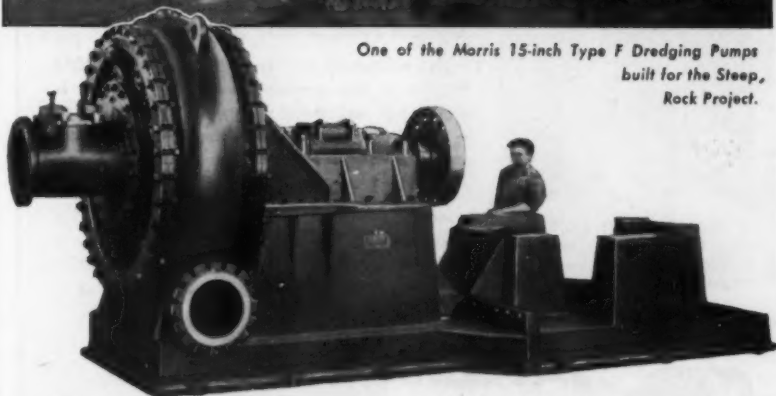
WARNER Co., Philadelphia, Penn., reported net sales of \$6,674,203 for the year ended December 31, 1944, which compares with \$8,882,113 for 1943. Net income in 1944, after charges and interest, was \$431,773 as against \$667,279 in 1943. Sale of lime and lime products for chemical, industrial and agricultural uses increased about 4 percent for 1944 while building material sales declined about 42 percent. President Charles Warner, in his message to stockholders, expressed the view that the prospective volume of construction work for the postwar period is large but the building material divisions probably will not reach full capacity before 1947. During 1945, these divisions will operate about 30 percent of capacity while the lime divisions should continue at practically full capacity.

PEERLESS CEMENT CORPORATION, Detroit, Mich., reported a net loss of \$23,625 for the three months to March 31, 1945. This compares with a net loss of \$40,172 for a similar quarter in 1944.

LONE STAR CEMENT CORPORATION, New York, N. Y., had a net profit of \$420,266 for the three months to March 31, 1945, as compared with \$458,226 the first quarter in 1944. Sales for the first three months in 1945 were \$6,547,160 as against \$6,205,382 for a like period in 1944.



One of the Morris 15-inch Type F Dredging Pumps built for the Steep, Rock Project.



Over 1,000,000 cu. yds. of Overburden pumped from Lake Bed in 5 months with

MORRIS TYPE F HEAVY DUTY 15 INCH DREDGING PUMP

Steep Rock Iron Mines, Ltd., has taken initial steps to permit open-pit recovery of iron ore from beneath a wilderness lake by changing the course of a river and draining the lake. Up to 120 feet of overburden is being successfully removed from the ore beds by a 15-inch Morris Dredging Pump, directly driven by a 750 hp. variable speed motor. This pump, installed in a Morris-designed dredge, is provided with 18-inch suction piping and 16-inch discharge piping.

As overburden is removed, and the dredge reaches levels approaching the ore body, a duplicate 15-inch Morris Dredging Pump will be installed in the pipe line as a booster unit. In the meantime this second Morris Pump will be utilized on another dredge.

The Morris Type F Heavy-Duty Dredging Pump is expressly designed for deep dredging, efficiently handling a high percentage of solids against high heads and through long pipe lines. It withstands abrasion through prolonged and severe service.

Write for Bulletin No. 158, containing complete specifications. Morris engineers, experts on dredging problems, and backed by eighty-one years reputation, will make recommendations on any dredging projects presented.

MORRIS MACHINE WORKS Baldwinsville, N. Y.

Branch Offices in Principal Cities



CENTRIFUGAL PUMPS

SAUERMAN

Long Range Machines



EXPLANATION OF PICTURE
Above is a Sauerman Scraper moving gravel from high hill to plant hopper. The operation is simple, cheap and SAFE.

WRITE FOR CATALOG

Dig, Haul and Dump for a few cents a yard

JOBs of stockpiling or of digging from pits, ponds and banks are simplified by using a Sauerman Power Scraper or Cableway.

This equipment is very flexible and is readily adapted to any ground conditions. First cost is reasonable, maintenance expense is small and the simplicity of operation permits easy one-man control of even the largest Sauerman installation.

There is a size and type of Sauerman machine to meet every capacity requirement from ten cubic yards an hour to many thousand cubic yards a day. And each machine, large or small, offers greatest possible economy of power and labor in its appointed task.

SAUERMAN BROS., Inc.

530 S. CLINTON ST., CHICAGO 7, ILL.

Lightweight Aggregate Plant and Fullers' Earth Deposit

at Ellenton, Florida
40 Miles from Tampa

Government-owned; to be Sold by Reconstruction
Finance Corporation (A Disposal Agency
Designated by Surplus Property Board)

This plant includes the machinery, equipment, railroad facilities, and utilities used to produce lightweight aggregate for concrete.

Comprises 22 structures—buildings, sheds, oil tanks, bins—of varied construction (steel, wood, brick and concrete). Repairs are required. Served by spur line (with sidings) of the Tampa Southern (A. C. L. System) R.R. Frontage of approximately 3900 ft. on the Manatee

River (about 6 ft. channel on southerly edge of tract—dredging necessary) with riparian rights; and approximately 5900 ft. on U. S. Highway 41. Inspection by appointment.

With the exception of about three acres covered by the plant and roadways, the entire tract of 333 acres contains approximately 300,000 cubic yards of Fullers' earth.

For complete information get in touch with

RECONSTRUCTION FINANCE CORPORATION



Industrial Facilities Section] OR [Western Union Building
Washington 25, D. C.] Jacksonsville 2, Fla.

BUY WAR BONDS

ALPHA PORTLAND CEMENT Co., Easton, Penn., showed a net profit of \$8436 for the year ended March 31, 1945, which compares with a deficit of \$146,307 for the 12 months ended March 31, 1944. Net sales for the 12 months to March 31, 1945, were \$4,911,711 as against \$5,686,445 for a like period ended March 31, 1944.

WOLVERINE PORTLAND CEMENT Co., Kalamazoo, Mich., had a net loss of \$71,119 for the year ended December 31, 1944, which compared with a deficit of \$38,910 for 1943.

SIGNAL MOUNTAIN PORTLAND CEMENT Co., Chicago, Ill., with plant at Chattanooga, Tenn., showed the following income account for years ended December 31:

	1944	1943
Net sales	\$2,117,181	\$1,907,373
Cost of sales	1,607,610	1,460,558
Selling, etc., expense	373,207	394,012
Operating profit	136,364	52,803
Other income, net ..	3,927	9,826
Total income	140,291	62,628
Fed. income tax	56,000	15,000
Pr. yr. inc. tax	30,000
①Net profit	54,292	47,628
Preferred divs.	75,596	75,596
Deficit for year	21,304	27,968
Earned surplus, 1-1 ..	505,486	533,454
Earned surplus, 12-31 ..	484,181	506,486
Earned pfd. share ...	\$2.87	\$2.52
②Earned, com. share ..	d 3.23	d 3.45
No. of pfd. shares ...	18,899	18,899
No. of com. shares ..	29,983	29,983
①After depreciation: 1944, \$77,359; 1943, \$81,294.		
②Disregarding preferred arrears.		

SOUTHERN PHOSPHATE CORPORATION, Baltimore, Md., reported net sales of \$1,826,374 for the year ended December 31, 1944, as compared with net sales of \$1,350,228 in 1943.

Sand-Lime Brick

FOUR active sand-lime block and brick plants reported for May and four for April, statistics for which were published in May, 1945.

AVERAGE PRICE FOR MAY

	Plant Price	Delivered Price
Detroit, Mich.	\$19.75
Saginaw, Mich.	\$15.00
Grand Rapids, Mich.	16.20
Seattle, Wash.	19.50	21.50

STATISTICS FOR APRIL AND MAY

	*April	**May
Production	886,406	1,018,340
Shipments (rail) ...	205,000	288,000
Shipments (truck) ..	531,406	592,340
Stocks on hand	1,056,000	1,007,000
Unfilled orders	1,370,000	280,000

*Four plants reporting: incomplete, one not reporting stocks on hand and one not reporting unfilled orders.

**Four plants reporting: incomplete, one not reporting unfilled orders.

Buy Quarry

RAY PICKELL, El Dorado Springs, Mo., has purchased the crushing plant equipment and quarry northwest of town from H. L. Morris. This plant has been producing a large volume of agstone and road construction materials.

OBITUARIES

AUGUSTUS EDWIN DICKINSON, former president of the Indiana Limestone Corp., Bedford, Ind., passed away May 30. Mr. Dickinson had been engaged in the stone business in Indiana from 1900 until his retirement ten years ago. He became president of the Indiana Limestone Company in 1926 and continued in that position when it was reorganized as the Indiana Limestone Corp. in 1932.

T. L. (ROY) WELCH, vice-president and general manager of the Cooley Gravel Co., Chillicothe, Mo., died recently at the age of 62. Mr. Welch became associated with the gravel company in 1927 and was in charge of sales until 1940 when he was made plant manager. He is survived by his wife, two daughters and five granddaughters.

EPHRAIM DALRYMPLE, founder of the Dalrymple Gravel and Contracting Co., Elmira, N. Y., died June 7. He was 90 years old. Mr. Dalrymple was born June 17, 1855, in the house at Bulkhead, N. Y., now occupied by his son, E. Henry Dalrymple, who is president of the company.

ERNEST W. FENWICK, superintendent of the Kelley Island Lime & Transport Co. plant at Kelleys Island, Ohio, since 1924, died May 6 in Toledo, Ohio, after a short illness. He was 73 years of age. Mr. Fenwick had been with the company since 1901. For some time prior to assuming the Kelley Island position he had been master mechanic at the Marblehead plant.

C. WALTER SPALDING, manager of the power transmission machinery division of Link-Belt Co., Ewart plant, Indianapolis, Ind., died May 25. Mr. Spalding had been with the company since 1910.

BARNEY BRENNAN, president and treasurer of the Valders Lime and Stone Co., Valders, Wis., and one of the founders of the company, died May 22 at Milwaukee, Wis., after a week's illness. He was 73 years of age. Mr. Brennan was born in Eaton in 1871, where he spent his early life, and then moved to Hayton where he attended school. He also went to high school in Chilton and after leaving school was employed by the Western Lime and Cement Co., as superintendent of the plant at Hayton. He continued in this position until 1904 when he was transferred to Ormsby, Wis., where he was in charge of a lumbermill, store and postoffice for the company. In 1907 Mr. Brennan moved to Valders to organize the Valders Lime and Stone Co. with the late T. G. Larson, Dr. T. J. O'Brien and Frank Einberger. He was also one of the organizers and for years president of the Valders State Bank.

Dredge Pump Shells Kept Going by Build-Up Arc-Welding

The dredge pumps subjected to heaviest duty are usually fitted with austenitic manganese steel shells, for greatest resistance to shock-stresses from boulders, combined with a first class resistance to abrasive wear. Even manganese steel wears out, of course, and it is wise to rebuild eroded areas in a shell before a hole develops or pump efficiency is greatly reduced.

offers greater resistance to impact and abrasion than the parent metal. The nickel content of the rod prevents embrittlement of the weld under air cooling and eliminates the necessity for quenching.



Pictures A-473 and A-474 show the rebuilding of the abraded interior of a manganese steel dredge pump shell by arc welding with Amsco Nickel-Manganese Steel Welding Rod. This material, as weld-metal applied to manganese steel castings, has properties comparable to the parent metal. It deposits in a uniform flat bead without porosity and with very little spatter or crater checks. When used to restore ordinary ferrous parts, the built-up portion



Picture A-216 shows the appearance of a pump shell interior rebuilt with Amsco electrodes.

Ask for Bulletin 941-W, which pictures and describes many profitable applications of Amsco welding products.

(Amsco Welding Products are produced and sold in Canada by Canadian Ramapo Iron Works, Inc., Niagara Falls, Ontario)



Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN
Brake Shoe
COMPANY

TESTED and APPROVED for use on high tensile strength wire rope, by Underwriters' Laboratories—official testing laboratories for insurance companies.

ONE SAFE-LINE CLAMP is designed to hold any wire rope without slipping. WIRE ENDS ENCLOSED. No needle-sharp wire ends, nuts and bolts exposed to injure workman's hands.

STREAMLINED! Will not catch on clothing nor on mechanical apparatus. Will not foul.

HOLDS A TIGHT THIMBLE. When thimbles are used they will not loosen and fall out.

SAFE-LINE

WIRE ROPE CLAMPS

THAT'S WHY IT NEVER SLIPS



ONE Clamp Does It

Ask Your DEALER

Write for details of this—the only PERFECTED wire rope clamp on the market. Millions used by Manufacturers, the Armed Forces and Industries.

NATIONAL PRODUCTION COMPANY

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DETROIT 13, MICHIGAN

Manufacturers' News

Koehring Co., Milwaukee, Wis., has appointed Ray Dorward, R. R. No. 3, Trafalgar, Ind., distributor for the new 205 half-yard excavator in the State of Indiana, except the counties of Lake, Porter, LaPorte, Starke, St. Joseph and Marshall.

The Foxboro Co., Foxboro, Mass., announces the addition of Harry D. Wagner to its staff of engineers serving the Cleveland area, with headquarters at 417 Bulkeley Bldg., 1501 Euclid Ave., Cleveland, Ohio.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has appointed Marshall L. Noel general sales manager of the tractor division. He was formerly industrial sales manager and long identified with the company's crawler tractor and road machinery sales. William J. Faulkner, formerly manager of the tractor division's Washington, D. C., office, becomes industrial sales manager, with F. B. Harrison and E. G. Kullmanns assistant industrial sales manager. H. A. Grätner has been appointed agricultural sales manager; Louis Adams has been made Harvester line sales manager with S. H. Sorensen as assistant sales manager. Ernest Franks has been placed in charge of wheel tractor sales for industrial purposes, in addition to his former duties as manager of power unit sales. Boyd S. Oberlink, until recently an assistant industrial sales manager, is appointed assistant to the vice-president of the tractor division.



Marshall L. Noel

Mack Trucks, Inc., New York, N. Y., announces three new appointments in the sales department: Harold Connor has been named manager of the Bronx and White Plains branches, and John J. Byrne has been appointed bus sales manager for the same territory. His post as national account sales manager for the Central division will be filled by R. J. Meinert.

Caterpillar Tractor Co., Peoria, Ill., has appointed F. D. Haberkorn assistant sales manager of the Central sales division, succeeding F. E. Rusher, who has resigned to become general sales manager and a director of Peoria Tractor & Equipment Co. C. A. Barabe, Jr., has been named assistant sales manager of the Eastern sales division.

Bemis Bro. Bag Co., St. Louis, Mo., announces that the company's employee publication "Bemistory" has won three of the six awards of the Industrial Press Association of Greater St. Louis.

Earle C. Bacon, Inc., Ansonia, Conn., announces that all of their products sold east of Kansas including the Metropolitan area but not New England or Long Island, will now be handled by Bacon-Pietsch Co., New York, N. Y., and that all products sold in New England and Kansas, north, south and west, and Long Island will be handled by Bacon-Greene & Milroy, New Haven, Conn.

The National Supply Co., Toledo, Ohio, has announced the appointment of Harry A. Olin, recently with the office of Industry Advisory Committees of the O.P.A., as credit manager of the Superior Engine Division.

The Timken Roller Bearing Co., Canton, Ohio, announces that Albert L. Bergstrom has been elected vice-president of all engineering.

Mine Safety Appliances Co., Pittsburgh, Penn., announces that its Philadelphia office is located at 5564 Baltimore Ave.



3 SIZES:
36 yd.
52 yd.
68 yd.

• These 3 standardized sizes of Erie general purpose Portable Aggre-meters are serving all parts of U.S.A.

In writing for data, refer to size required: GA 36 yd. or 54 ton

GA 52 yd. or 78 ton

GA 68 yd. or 102 ton

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ERIE STEEL CONSTRUCTION CO.

ERIE, PENNSYLVANIA

Aggre Meters • Buckets • Concrete Plants • Traveling Cranes

Atlas Powder Co., Wilmington, Del., announces that plans are under way for the construction of new units to expand the research facilities of the company. Application has been made to the W. F. B. and construction will go ahead as soon as approval is received. Kenneth R. Brown is director of the research department.

Allied Steel Products, Inc., Cleveland, Ohio, has announced that C. H. Richardson has resigned his connection with the company and will devote the summer months to promoting an auto ferry and passenger steamship service across Lake Erie between Sandusky, Ohio, and Canada. The steamship service is an account of the Oleida Advertising Agency, Sandusky, Ohio, which is owned by Mr. Richardson.

Chicago Bridge & Iron Co., Chicago, Ill., announces that following the death of George T. Horton, the directors have elected Merle J. Trees chairman of the board and Horace B. Horton president of the company. Mr. Trees has been with the company since 1908, a director since 1913, and executive vice-president for some years. Mr. Horton has been with the company since 1907, a director and treasurer since 1912 and recently a vice-president. He will continue his duties as treasurer. Irving E. Bobery has been appointed chief engineer to succeed O. A. Bailey, who will continue to serve the company in an advisory capacity.

LaPlant-Choate Mfg. Co., Cedar Rapids, Iowa, has named K. V. Turner a district representative in charge of the Washington, D. C., office, covering parts of Virginia, W. Virginia, Maryland, Pennsylvania, New Jersey and New York. A. C. Cartwright, formerly in Mexico City, is now district representative for the southeastern territory with headquarters at Atlanta, Ga. Milo Davin, formerly central area service manager, has been placed in charge of the Central West territory with headquarters in Cedar Rapids, Iowa. S. I. Harris resumes his old post as district representative for northern California and Nevada with headquarters at San Leandro, Calif.

Farrel-Birmingham Co., Inc., Ansonia, Conn., has announced the appointment of Armin G. Kessler as manager of sales of the midwestern district, with headquarters in Akron, Ohio.

The Nicholson Co., Inc., New York, N. Y., announces that A. A. Nelson has rejoined the company as a vice-president after an absence of two years. During this time he was engaged in the design and construction of defense plant facilities in the Middle West.

Link-Belt Co., Chicago, Ill., announces removal of the Huntington, W. Va., office from 2840 North Staunton Road to Suite 1301-1302 in the West Virginia Building, 4th Ave., & 9th St., postal zone 9.

Nordberg Mfg. Co., Milwaukee, Wis., announces the return of G. J. Brown to active duty as manager (Overseas) of its London branch offices. Mr. Brown has been on government service in Britain for the past five years, in charge of essential war production. J. P. Buris, formerly chief engineer (Overseas) has been made South African branch manager.

Pettibone-Mulliken Corp., Chicago, Ill., announces that John Gronlund has joined the organization as director of sales in the construction equipment division.

Wickwire Spencer Steel Co., New York, N. Y., has appointed Sidney E. McCrum as assistant advertising manager. He was formerly assistant to the advertising manager of the Chicago Pneumatic Tool Co., New York.

Oliver United Filters, Inc., New York, Chicago and Oakland, Calif., announces the appointment of Leon D. Thompson as export sales manager.

Thermold Co., Trenton, N. J., has announced that H. W. Overman has been placed in charge of industrial friction materials.



On the heavy-duty jobs . . . the jobs where the load keeps coming . . . the jobs where the screen must take a pounding hour after hour . . . the Plat-O Vibrating Screen has proved itself a *standout* for stamina.

In the Plat-O Screen, the emphasis is on rugged durability at every point of design and construction. Heavy steel framework and sides are of all-welded construction. Bearings, drive shaft and other parts which must take wear are oversize. There are

no eccentrics and only two bearings (SKF Spherical Roller).

That's why, for the punishing jobs, more and more producers of aggregates and agricultural limestone are turning to Plat-O for better sining—cheaper. That's also why it will pay you to ask Deister Machine Company engineers for the whole story on efficient and lower cost grading with Plat-O Vibrating Screens. Write today for complete information.

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PULVERIZERS

Hundreds of Installations . . .
Use Bradley Pulverizers

for the reduction of

AGRICULTURAL LIMESTONE
Cement Materials and all
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CAPACITIES: 1 TO 50 TONS PER HOUR
FINENESSES: 20 TO 350 MESH

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**Need GREATER
RANGE OF
REDUCTION**
with faster,
lower-cost output?

**Then check the exclusive features of
AMERICAN CRUSHERS!**

Efficiently reduces:

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SLATES
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MICA
PHOSPHATE ROCK
CONCRETE AGGREGATES

Its great range of reduction and easy breaker-plate adjustment provides a one-step operation for reducing breaker sizes to roadstone and macadam coarseness or agstone fineness—and sizes in between.

Production up to 250 tph is an hour after hour, day after day, performance of American Crushers.

American Crushers are of heavy duty construction throughout with manganese steel hammers and alloy steel shaft with anti-friction bearings mounted in dust-tight pillow blocks.

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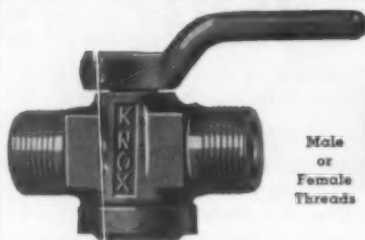
Guaranteed to give you best results on your most difficult separations. UNIVERSALS are of rugged yet simple construction, lowest in first cost and in maintenance. UNIVERSALS have been tried and proved in 25 years of dependable service.

Write for 32-page catalog on screens and screening.

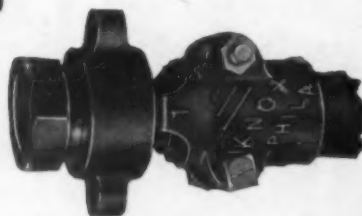


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Double
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RACINE -- WISCONSIN



Male
or
Female
Threads



Since 1911 Producers of

Recognized Universally as the **ULTIMATE**
in Valves and Couplings

KNOX
Valves-Couplings-Nipples-Clamps-Welders

KNOX MANUFACTURING CO.
818 CHERRY ST., PHILADELPHIA 7, PA.

Bay City Shovels, Inc., Bay City, Mich., has built a new addition to its plant, the third since Pearl Harbor, for the increased production of crawler and pneumatic-tire-mounted excavating and material handling equipment for the Armed Forces. The new building was designed and built by the Austin Co., Detroit, Mich.

Cleveland Pneumatic Tool Co., Cleveland, Ohio, announces the following promotions: Elmer J. Steger, manager of the pneumatic tool and appliances division, has also been appointed manager of the Cleveland rock drill division. Mr. Steger is executive vice-president and treasurer of the company's Canadian subsidiary, Cleveland Pneumatic Tool Co. of Canada, Ltd. Charles E. Vanderpool, former assistant manager of the pneumatic tool division has been made sales manager of that division. Albert H. Hruby, recently in charge of contract termination, becomes sales manager of the rock drill division, and Robert Craig has been named manager of export sales.



Elmer J. Steger

The Dorr Co., New York, N. Y., has appointed T. B. Counselman head of the contract engineering division, with headquarters in New York, N. Y. He has been manager of the industrial division in the Chicago office since 1928.

Chase Bag Co., New York, N. Y., announces that contracts have been signed for a new paper bag manufacturing plant at Crosssett, Ark. Work on the plant is just beginning. No official opening date has been set.

The Osgood Co., and The General Excavator Co., Marion, Ohio, announces that Lieut. Col. Myles (Ken) Stolz, formerly advertising and sales promotion manager for the two companies, has been presented with the Bronze Star Medal for meritorious service in connection with operations against the enemy. Colonel Stolz received the medal at the 15th AAF Headquarters where he is executive staff officer in operations.

General Electric Co., Schenectady, N. Y., has appointed J. J. Huether as assistant manager of the Industrial Divisions, and W. A. Wirene as manager of the Industrial Materials Division, Industrial Divisions. Mr. Huether had been manager of the Industrial Materials Division for eight years, with Mr. Wirene as assistant manager since 1942.

Army-Navy Awards

Broderick & Bascom Rope Co., St. Louis, Mo., is the recipient of a sixth star for its Army-Navy "E" pennant for continued excellence in the production of war material.

Farrel-Birmingham Co., Inc., Ansonia, Conn., for the sixth time in three years has been recognized for its excellent production record by the award of the fifth star for its "E" flags.

Davenport Besler Corp. (Davenport Locomotive Works), Davenport, Iowa, has received a third renewal of the Army-Navy "E" award for continued outstanding production.

Macwhyte Co., Kenosha, Wis., has been awarded a third star for its Army-Navy "E" pennant for outstanding achievement in war production. This is the fourth award since November, 1942.

American Steel & Wire Co., U. S. Steel Corp., Cuyahoga Works, Cleveland, Ohio, has been awarded the coveted Army-Navy "E" pennant for excellence in the manufacture of war materials.

ROCK PRODUCTS
CONCRETE PRODUCTS
and Cement Products

JULY
1945

Concrete joists and roof channel units for industrial structures in the West



BESSER Automatic Super VIBRAPAC

9 IMPORTANT FEATURES

1. One Set of Plain Pallets for ALL SIZES OF UNITS.

Additional pallet cost eliminated.
Size Vibrapac Plain Pallet: 18½"x26".
8" block made 3 at a time.
6" block made 4 at a time.
4" block made 6 at a time.
Solid brick made on end 32 at a time.
Other sizes made in equivalent multiples on one pallet.

2. Fully Automatic Machine. Continuous full capacity operation with no machine operator. The Vibrapac sets and keeps the pace. Pallets are fed automatically.

3. Power Offbearing Hoist. One man offbears 600 8"x8"x16" units or equivalent per hour. Offbearing cost reduced two thirds.

4. Greater Production. 600 8"x8"x16" block, or equivalent in smaller units or fractionals, made per hour.

5. Instantaneous Mold Release. No tools are required. Complete mold attachment change in less than 30 minutes.

6. Undirectional Vibration. The mold rests on rubber and is free to vibrate in any direction. With no metal-to-metal contact between mold and frame, there is no crystallization of steel and vibration sound is minimized.

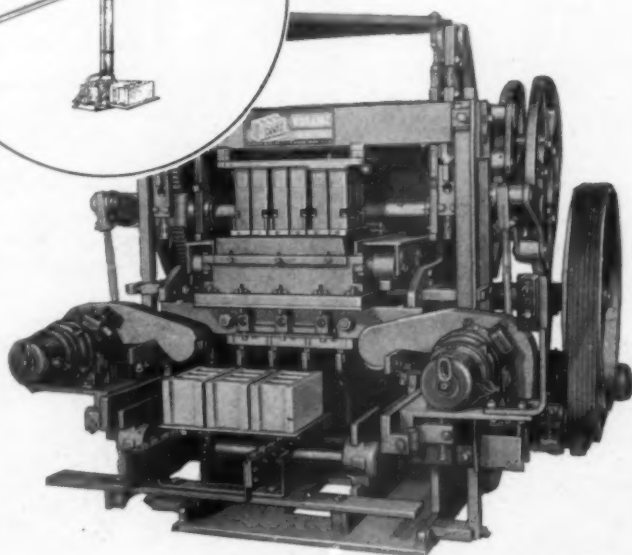
7. Uniform Control of Density and Texture of Block as required for different uses. Accuracy of dimensions secured by vibration under pressure within the mold.

8. Plain Pallet and Bottom of Mold Sealed by Accurate Fitting Contact During Vibration. Semi-wet mix, for greater strength units, can be used without "bleeding" of cement, fines or water.

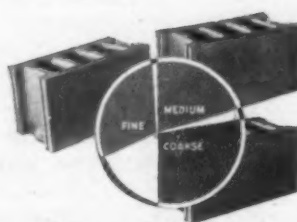
9. Strength and Durability. Simplicity of Construction. One piece steel frame. Few moving parts. High production with slow speed of cam-controlled moving parts insures long life of machine.



One man offbears 600 8" (or equivalent) blocks per hour with power hoist.

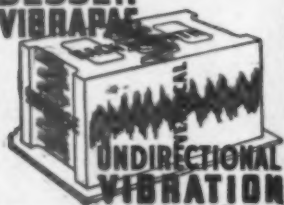


**VIBRAPAC
SELECTIVE
TEXTURE
AND
DENSITY**



Besser Vibrapac Better Concrete Masonry Units in the hands of skilled architects and builders have become in effect a new building material.

**BESSER
VIBRAPAC**



Important Patent Notice

Licensed under the Gelbman basic vibration patents.

Undirectional vibration licensed under Flann patents.

The Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

BESSER MANUFACTURING CO.

207 Forty-Fifth St.

Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

From BOMBS to Burial Vaults

Arnold Stone Co., has diversified its line of concrete products to include practice bombs, coal bins, bath tubs, roof slabs, and channel block

By H. E. SWANSON

CONSTANTLY ALERT to the importance of developing new concrete products, the Arnold Stone Co., Greensboro, N. C., is now manufacturing several new and unusual items. They include a precast concrete fuel tank support, a coal bin, the "Commonwealth" bathtub, and practice bombs made in molds which were designed at this company's plant.

Concrete Bombs

While many other concrete specialties have been and still are made, production is now largely devoted to the war effort. Concrete practice bombs, for example, constitute a large part of the output. The forms for the bombs were designed by Mr. Arnold, president of this company, in conjunction with the Formigli Bros. of Berlin, N. J. They are constructed of reinforced lightweight concrete, with Haydite aggregate, and are made in three pieces, consisting of a base and two sides. The forms are painted with form oil prior to pouring the concrete, to assist in easier removal of the bomb from the mold. Metal lugs are fitted into the mold when the concrete is poured and are thus attached to the finished product. External vibration by a Chicago Pneumatic vibrator assists in producing a smooth finish. The finished weight of the bomb must be, according to specifications, 95 lb.

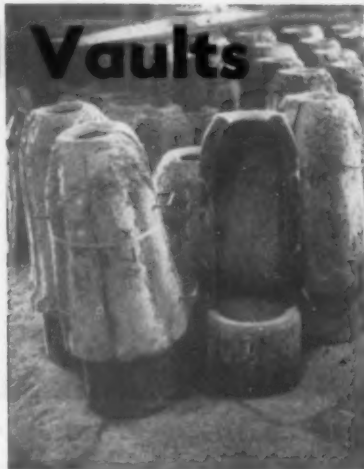
plus or minus 2 lb. Spraying and stencilling of the bomb is also done at this plant.

In the accompanying illustration is shown the fuel tank support. While



President M. A. Arnold, to the left, and J. H. Schlag, vice-president

visiting Federal housing projects, where oil instead of coal was used, the thought that some support was necessary for the drums prompted Mr. Arnold to design and manufacture this product. It is made in three sections which are easily assembled, and has a total weight of 245 lb. The



Concrete forms for practice bombs

center section contains two $\frac{3}{8}$ -in. reinforcing rods which protrude at either end for the purpose of effecting union when assembling. This item has been in production for the past two years, and has been adopted as standard in Federal Housing plans.

Concrete Coal Bin

Another unit manufactured for the past five years and designed to meet the need in housing projects, is the concrete coal bin. This bin, shown in an accompanying illustration, has a 24-cu. ft. capacity, a weight of 1128 lb., and is composed of about 96 percent non-critical materials. The interlocking design permits assembly in approximately 10 minutes.

Roof Slabs

Roof slabs, bearing the trade name "Channel-Crete," and "Arnco" flat slabs, are also produced. These are made with Waylite and Haydite lightweight aggregates and the fireproofing qualities together with the lightness in weight offer advantages which are highly desirable for warehouse, hospital, and commercial building



Left: Looking down aisle in new building devoted to manufacture of concrete burial vaults. Right: Lids of burial vaults rest on concrete pedestals



Finishing concrete floor joists after pouring in molds



Concrete roof slabs may be seen to the right; to the left, sections of concrete coal bin

construction. The slabs, as well as the other products, are wet-poured, have a maximum span of 8 ft., a 24-in. width, a 3½-in. thickness, and a web of 1¼ in. They are reinforced with two deformed bars and galvanized welded wire mesh. The weight is about 15 lb. per sq. ft.

Concrete Bathtubs

Another popular product which has been made since 1942, is the "Commonwealth" concrete bathtub. It is cast in one piece in steel molds and is externally vibrated. A specially designed mix, known as "Dex-ite," produces a tub which weighs 245 lb., or about 50 lb. less than a cast-iron tub. After being properly cured, the tub is sprayed with four coats of a thermoplastic paint. Spraying is done in a spray booth equipped with fan to draw off fumes. A model 50J Par air compressor with 5-hp. Peerless electric motor provides air for the spray gun. The size of the tub, shown in an accompanying illustration, is 14- x 28- x 58½-in. The principal market for this product is

to housing projects, dealers, and plumbing supply houses all over the United States.

Channel block, to form a tie beam connection in block wells, is another item which is an original at this



Channel block, into which concrete is poured prior to laying up cored block in the wall

plant. As shown in the illustration, the channels, 8 in. wide and 7¼ in. deep, are made in various lengths, and have 1¼ in. walls. A light wire mesh reinforcing is used. The channels permit placement of block immediately after concrete has been poured into the channel.

"Mo-Sai" Slabs

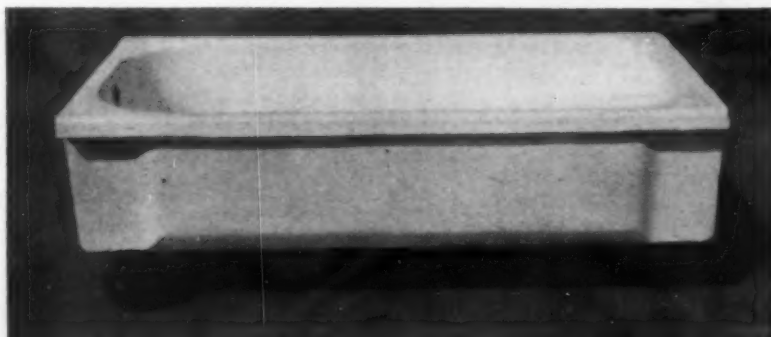
The major post-war item which will be produced is the "Mo-Sai" concrete architectural slab, which was produced prior to 1942 but the more critical war items necessitated its discontinuance until after the war. This is a thin, precast masonry material made of special type aggregate. The principal application of the slab is for exterior decorative purposes. It is made 2 in. thick and in sizes up to 100 sq. ft., with a weight of 25 lb. per sq. ft.

The need for more room to produce specialty items prompted this company to construct a new building on the outskirts of Greensboro solely for the purpose of producing Wilbert burial vaults. The license to manufacture these vaults was secured in 1932 and since that time about 500 have been produced annually. Since 1943, when the building was erected, the original plant has been devoted entirely to the production of precast concrete specialties.

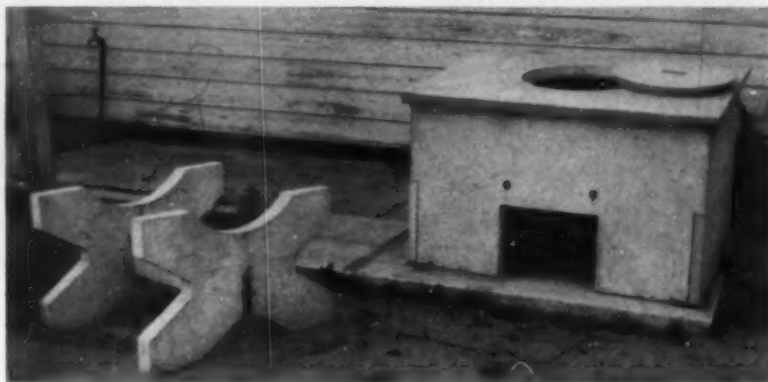
Concrete is mixed in the specialty plant at one end of the plant and is moved to the various forms by a 2-ton Chisholm-Moore travelling crane. Most of the concrete is poured wet and vibrated by Branford and Chicago Pneumatic vibrators. After stripping, the products are water-and-air-cured.

Plan to Move Plant

With the increase in number of products manufactured and with the thought that others will be made in the future, this company is planning to move the specialty plant to a new location in Greensboro, where more room will be available. The new



Precast concrete bathtub which is given a smooth white finish by spraying with a special paint



To the right, assembled concrete coal bin; to the left, oil drum support

plant, which will probably be ready next Fall, will be more mechanized and modernized for greater production.

M. A. Arnold, past president of The Cast Stone Institute, is president of the Arnold Stone Co.; J. H. Schlag is vice-president, and Mrs. Mary Arnold is secretary.

Concrete Watering Trough

DIFFICULTY in obtaining galvanized iron tanks led English concrete products manufacturers to design a concrete watering trough for stock. It is probable that if products manufacturers in this country make a concrete trough of sufficiently high quality that it can be sold in competition with the galvanized iron type even after the war.

A. M. Pennington, writing in *Concrete Building and Concrete Products*, England, describes the trough shown in the illustration. This trough is double-ended so that it may be placed half-way through a fence and provide water in adjoining fields. The boxed-in center section protects a ball valve connected to the water supply which automatically maintains the water at a constant level. Edges of the trough are rounded.

The main part of the trough, Fig. 1, is cast in one piece in a two-piece mold, the core being tapered to facilitate easy removal. When casting,

the bottom of the outer mold is covered with concrete to a thickness of $1\frac{1}{4}$ -in., the reinforcement placed in position, and further concrete added to bring the thickness up to $2\frac{1}{2}$ -in. This surface, which forms the bottom of the finished trough, is troweled and paper laid over it (but not

beyond the boundary of the core), the core is placed in position, and the mold filled. The purpose of the paper is to reduce the suction when the core is withdrawn. To prevent the core from rising, it must be clamped down or weighted. This method of manufacture is suitable if more than one casting per day is required. If one casting a day is sufficient it is simpler to make the trough upside down, and in this case also it is helpful to cover the bottom of the core with paper.

Slots are cast in the trough to receive the sides of the valve box, Fig. 3; these are fixed in position by bedding them in cement mortar. A hole is cast in the side of the trough through which the shank of the ball-valve passes. A $\frac{1}{2}$ -in. ball-valve with screwed shank 3in. long is used; if this is unobtainable a valve with a standard shank may be used and extended by means of a nipple and socket.

Fig. 4 also shows how the cover may be secured by a simple locking device which prevents unauthorized persons from tampering with the valve. Holes, $\frac{3}{8}$ in. in diameter, are cast centrally in the sides of the valve box and a piece of $\frac{1}{4}$ -in. bar, bent to the form of a hairpin with the ends splayed outwards, is sprung into the holes. A slot is cast in the cap through which the bend of the hairpin passes, and a padlock secures the hairpin to the handle of the cover, so that the cover cannot be lifted without first removing the padlock.

A suitable concrete mix is 4 parts of washed gravel graded $\frac{3}{8}$ -in. down to 1 part of portland cement. Only 7 lb. of steel are used in each trough.

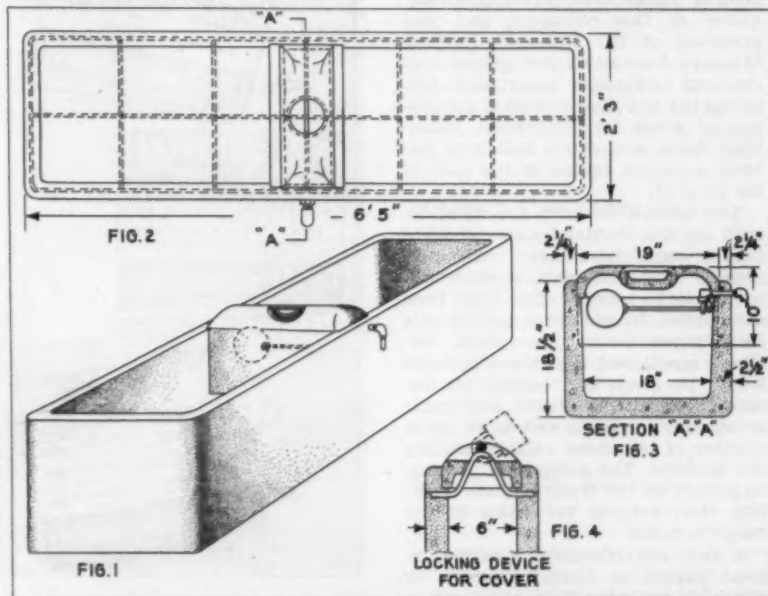


Fig. 1: Watering trough of reinforced precast concrete. Fig. 2: Reinforcing details. Fig. 3: Cross-section of ball valve box. Fig. 4: Method of locking valve box

By H. E. SWANSON



Modernistic office building constructed with concrete products supplied by Chase Building Products Co.

ADVERTISING Pays Dividends

AGGRESSIVE merchandising by Chase Building Products, Fort Worth and Dallas, Texas, has brought the value of concrete block for building construction to the attention of home and factory builders in the north central Texas area. John S. Chase, owner of this company, and past president of the National Concrete Masonry Association, has proven that constant newspaper advertising, featuring the free distribution of pamphlets of plans for residential, industrial, farm, and ranch buildings, has been a potent factor in the sale of his product.

The pamphlets used are those issued by the Portland Cement Association and have been extremely popular with customers, as evidenced by the large number that have been distributed. In one story carried in a local paper about this plant, Mr. Chase mentioned that these booklets would be given on request. He received almost 100 letters and cards in one day's mail as well as an equal number of telephone calls requesting the booklets. The company's name is imprinted on the front of these booklets, thus keeping the name in the reader's mind.

A daily advertisement is carried in local papers, a typical example of which is reproduced in this article. This small advertisement has brought in an extra revenue to this company

AVAILABLE NOW
Without Priority
DALCRETE
—the structural concrete
WALL BLOCK—
FREE Complete book-
lets for: Residential,
Industrial, Farm and
Ranch Building Plans.
No Cost Plans!
See Your Architect Today About
Plans, Wall or Plans!

CHASE BUILDING PRODUCTS
2910-GASTON - DALLAS 1 - 1-2373

INSULATE
A 3 Room House
with **INSUL-COTTON** Flame-Proof
INSULATION
Resists fire, moisture, vermin and rodents—
Savings up to 30% on gas bills.
Payments \$5.00 per month.

CHASE BUILDING PRODUCTS
2910-GASTON - DALLAS 1 - 1-2373

Now USE CONCRETE JOIST
TO ARCHITECTS AND ENGINEERS:
Send for FREE Booklet of tables of how
to design and build DALCRETE Vibrated
Precast Joists and Concrete Floors.
TO PROSPECTIVE BUILDERS: Invest-
igate the use of economical concrete joist.
See Your Architect or Engineer Today
about Plans or Plans!

CHASE BUILDING PRODUCTS
2910-GASTON - DALLAS 1 - 1-2373

Typical newspaper advertising copy which is run consistently in all leading papers in Fort Worth and Dallas

of over \$2000 per month, according to Mr. Chase. The scarcity of lumber during these war days has given concrete block the added feature of being a means of conserving critical material, which is one reason why this advertisement has proven so effective. Experience has shown that many local home builders and farmers are reached through the daily insertion of the advertisement. It will be noticed that the advertisement reproduced here carries the trade name "Worthcrete," which is the name for the concrete block produced at the Fort Worth plant. The Dallas plant produces a unit which is called "Dalcrete."

In addition to the local farm and home builder's market which has been built up by consistent advertising and aggressive merchandising, this company has provided, during the past two years, a total of 3,000,000 concrete units for various government projects throughout Texas and Oklahoma. One of the best advertisements for concrete block and building construction is the business office of the McCann Construction Co., which was constructed with "Worthcrete." Glass block and regular brick also used in the construction were supplied by this company, which deals in many types of building materials as well as the production of concrete block. An illustration of the



From left to right: John Chase, owner; Mrs. Ethel McKinney, secretary; J. W. White, Fort Worth manager; and G. C. Crumpler, auditor

office mentioned is shown in an accompanying illustration.

Block are produced on two Anchor tamper block machines at the Fort Worth plant, capable of producing 9000 5- x 8- x 12-in. block per day, which is the size most in demand in this area. The Dallas plant also is equipped with two Anchor tamper block machines with the same daily production. Aggregates (sand and gravel) are weighed to determine consistency of mix and strength. The finished block are placed on wooden racks and transferred to the storage yard by manually operated lift trucks. Here they receive water and air curing. All sizes of block are kept in the stockpile. In addition to concrete block, lightweight block are produced on order, using a red cinder aggregate received from New Mexico. The resulting block has a reddish tint which gives a pleasing color to the finished wall built with this block.

Lintels and joists are also made here. The vibrating joist machine makes ten joists per operation up to 20 ft. long. Thus, 200 lineal feet per day can be made. This machine is housed in a separate building. Other products for which this company acts as distributor are concrete and regular brick, cement, glass block, "Insl-Cotton," which is a cotton insulating material, concrete pipe, and many other types of building materials.

J. W. White is manager of the Fort Worth plant, which has been producing concrete units since 1927, and James F. S. Campbell is manager of the newer Dallas plant.

Move to New Factory

C. R. BRADLEY & Co. moved into its new concrete block plant at 501 W. 22nd street, Houston, Texas, on April 1. The new building is 40- x 80-ft. Both concrete block and concrete brick are manufactured.

Concrete Rat Shield

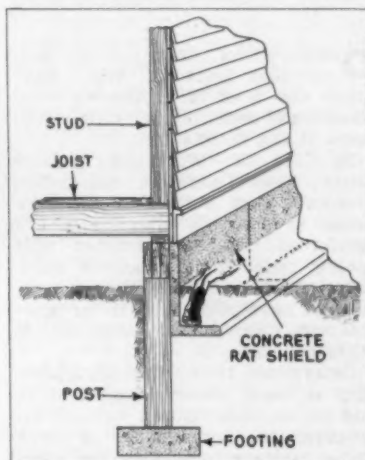
THE BUFFALO SEPTIC TANK Co., Buffalo, N. Y., is producing a pre-cast concrete rat shield for use with buildings that were constructed without foundation walls. This shield was designed and manufactured under the supervision of Harold Sutter, president of the company. The Health Department of the City of Buffalo under Dr. James W. John-



President Harold Sutter, Buffalo Septic Tank Co., displaying concrete rat shield made in his plant

son, Jr., has started a campaign to rid the city of rats and hence reduce the danger of diseases they carry and spread.

The shield is an "L" shaped section, two and three feet long by two feet in height with a 12-in. shelf at the bottom. This shield is one of several suggested plans to "build the



Showing how rat shield is installed

rats out" which is about to be printed and distributed in bulletin form. Another bulletin describing exterminating methods will be printed for distribution at the same time.

Sell Block and Ready Mix

THE WISCONSIN VALLEY CONCRETE PRODUCTS Co., Wisconsin Rapids, Wis., recently opened a new plant at Fifth and High streets. Ray Melville, president and general manager, was a former construction superintendent with government contractors in Canada and Alaska. Other officers are Eleanor Kutchera, vice-president, and Ralph Kutchera, secretary-treasurer. Sand and gravel and cinder concrete masonry units will be made. It is also planned to supply ready mixed concrete and manufacture concrete pipe in small sizes.

Making Concrete Brick

PACIFIC CONCRETE PRODUCTS Co., Vancouver, Wash., is the name of a new concern which is now making concrete brick. James Lundgren, owner, has secured a franchise from the Brikrete Co., Grand Rapids, Mich., for sole manufacturing and selling rights for the areas of Clark county in Washington and Multnomah, Columbia and Clackamas counties in Oregon.

Start Block Business

JOPLIN BLOCK & MATERIAL Co., Joplin, Mo., has started the production of concrete masonry units. A new building has been constructed, and a Besser Vibrapac machine and mixer has been installed. Robert D. Morre is the owner.

More Concrete for the Dairy Industry

Better sanitary conditions, ease in keeping clean, fire-resistant construction and availability of materials are turning more farmers to the use of concrete

OPERATORS of dairy plants surrounding Oshkosh, Wis., have taken the lead in sponsoring construction of modern dairy farm structures at the County Fair.

In 1943 the Winnebago County Dairy Plant Operators Association sponsored and built a model milk house in concrete masonry and a reinforced concrete insulated milk cooling tank (Rock Products, April, 1944). This innovation was successful and resulted in ten similar projects on County Fair Grounds in other counties.

Determined to continue its leadership in such undertakings and to add to its contribution toward increasing the production of milk under sanitary conditions, the Association once again stepped out in front and sponsored an exhibition of fast milking, or so-called three-minute milking, to show the farmers attending the fair the many advantages of this method.

This demonstration involved the construction of a modern dairy barn floor in order to impress the farmers that sanitary conditions must prevail in the dairy barn and to show them the very latest design and construction features of such a floor in concrete.

Unable to finance the construction of a complete dairy barn, a section of concrete floor 16- x 24-ft. was built and covered during fair week with a canvas canopy. This floor was of a size sufficient to accommodate six milk cows and so located as to be readily accessible to the fair visitors, and it was raised 14 in. above

grade so the milking contests could be readily seen by the spectators. The floor included a feed alley, mangers, platform, manure gutter, and half a litter alley.

Supply Ready Mixed Concrete

Built in concrete and in accordance with the best design practices recommended by the University of Wisconsin Extension Division, it represents the ultimate in dairy barn floors. Concrete for the project was furnished by Cook & Brown Lime Co., Oshkosh, and Courtney & Plummer, Neenah, producers of ready-mixed concrete. Stanchions and barn equipment were donated by the Hudson Mfg. Co., and the milking equipment was loaned by the DeLaval Separator Co. A. W. Jeske, Oshkosh contractor, loaned the forms and construction tools, and the work was performed by members of the Operators Association, the county agricultural agent, and state dairy inspector.

Once again the alert and keen leaders of the Dairy Plant Operators' Association have done an effective job of informing farmers regarding latest and best construction practice for the modern dairy farm. They have created the desire in farmers to have a similar floor in their own barns and thus improve sanitation, reduce hours of labor, and increase milk production. Adjacent to the model milk house erected in 1943 it illustrated the need for milk cooling facilities properly located. It again focused attention on the milk house and created interest in it to even a

greater extent than was evident in 1943.

The fast milking or three-minute milking contest was participated in by vocational agriculture students, 4-H Club members, and boys who are members of Future Farmers of America. Cash prizes were awarded to the winners of each day's contests and the grand prize winner staged a demonstration the final day of the fair during which he milked all six cows while being watched by 1,200 people.

The contest included not only the actual milking but also the preparation of equipment, preparation of the cows, handling milk and cooling it, and the care of milk house equipment. Judges based their decisions on all these items in the process, each item being assigned specific point values.

The dairy plant operators were well pleased with this, their second demonstration. Another demonstration at the 1945 county fair has not yet been determined.

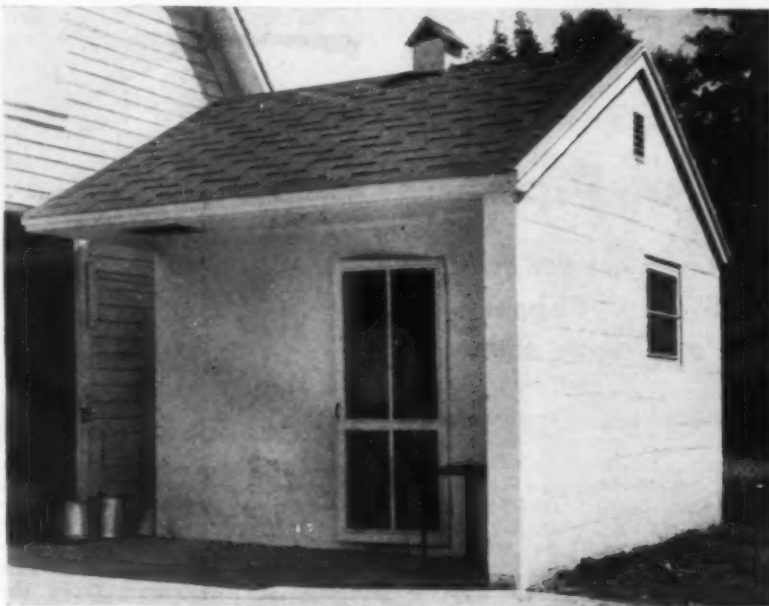
Model Chicken and Hog Houses Being Considered

In view of the success of this undertaking, other county agricultural officials are giving thought to a similar project at their county fairs. In some counties the construction of model chicken houses and hog houses is being considered, especially in the counties where hog and chicken raising represents a major part of farm activities.

All such projects are fine advertising and promotion tools not only for



Left: Model concrete floor for dairy barn used for three-minute milking contest, Winnebago County Fair. Right: Preparing for milking contest



Typical model milk house constructed of concrete block

producers of ready-mixed concrete and concrete products, but also for better farm conditions, greater food production, and decreased hours of work. It is for these reasons that University and State officials, county agricultural agents and others lend their support in the promotion of such projects.

These models created interest in counties adjacent to the point where dairy plant operators and county agricultural agents are determined to have one on their own fairgrounds for the 1945 fair. Definite steps toward this goal have already been taken in ten counties.

That these projects are worth while to commercial interests, beneficial to state and county dairy officials, and of lasting value to the community and the participants is proved by the fact that the Winnebago model attracted more attention and created more interest in 1944, its second year, than in 1943.

There is no doubt but what it and all the others will continue to do the job down through the years—the job of showing the farmer that only with a sanitary, firesafe, and durable milk house and an insulated concrete cooling tank can he continue to be assured of the production of high quality milk. Likewise, they will continue to create new business for concrete and concrete masonry producers.

Editor's Note: In the April, 1944, issue there appeared a description of the Winnebago County milk house project, and in this article it was predicted that many more such projects would be initiated and executed during 1944. That prediction has come true. We do not hesitate to repeat the same prediction for the year 1945.

Model Milk Houses

THERE are now eleven model concrete masonry milk houses on County Fairgrounds in Wisconsin. Following the lead taken by the Winnebago County Dairy Plant Operators' Association in 1943, ten more counties now have a milk house as part of their permanent exhibits at their County Fairs. These milk houses, built in accordance with plans approved by the University of Wisconsin, Extension Division, are equipped with reinforced concrete insulated milk cooling tanks and include the latest ideas in design and location.

The model built in Winnebago County in 1943 attracted statewide attention. It resulted in the erection of great numbers of milk houses on farms in that area. It fostered a desire on the part of farmers to improve sanitary conditions. It knitted together the Dairy Plant Operators of the County. It increased the business of the concrete products manufacturers, the ready-mixed concrete producers, materials dealers, and rural contractors. It assisted the County Agents in promoting dairy farm sanitation. It aroused public interest. It showed farmers how to build and locate a milk house. It was "what the doctor ordered" for helping the State Dairy Department and the University in furthering their campaign for greater production of cleaner milk.

"If such a project was successful in one county, why won't it be equally so in other counties?" was the question on the lips of various State and County agricultural officials and dairy plant operators. The

answer is obviously "yes" and this answer was proved to be the correct one by ten more counties at their 1944 fairs.

The interest aroused among the farmers, the benefits derived by the dairy plants, and the actual milk houses constructed as a direct result of the models equalled in every case those obtained in Winnebago County. Development of the projects followed generally in all cases the pattern set in 1943.

One or two meetings of the dairy plant operators were sponsored jointly by the University of Wisconsin, the State Dairy Department, and the County Agricultural Agent. Importance of dairy farm sanitation was stressed by speakers and by sound movies. Benefits to be derived by operators in their promotion of better farm structures was pointed out. The detailed procedure was carefully outlined and generally discussed. In most cases the dairy plant operators had no organization to start with so that had to be effected before a milk house committee could be appointed to carry the project to a successful conclusion.

This committee determined methods of financing, usually assessments on each operator proportional to his capacity or numbers of patrons, negotiated with the County Fair Board for a site and permission, and arranged for contributions of materials from local producers.

Concrete masonry manufacturers, ready-mixed concrete producers, local builders supply dealers, and paint and hardware stores were in all cases anxious to participate and did so in the form of donating sufficient materials to erect and equip the structure as a modern milk house. Such contributions pay big dividends almost immediately after the fair and continue to create business for years to come. The donors names are placed on a suitable plaque which becomes a permanent fixture inside the milk houses for everyone to see.

Model milk houses were constructed in Brown, Marinette, Manitowoc, Outagamie, La Crosse, Sauk, Vernon, Lincoln, Wood, Calumet, and Pierce Counties. All were of concrete masonry except the one in Pierce County which was frame construction. The concrete products manufacturer in that county at Ellsworth was too busy to make the block for it.

Donors of concrete block included the following manufacturers: Wm. Fricke & Sons, Manitowoc; Prashak Quality Block Co., Marshfield; Economy Block Co., Wauwatosa; Van Ess Concrete Block Co., Green Bay; Strong Concrete Block Co., La Crosse; Popp Concrete Products Co., Neenah; A. E. Hoerning & Son, Menasha; Van Ess Concrete Block Co., Green Bay; and Baraboo Concrete Products Co., Baraboo.

Concrete Pipe

DRAINAGE Requires Large Volume of Pipe

Black-Brollier, Inc., Houston, Texas, has had two pipe plants working to capacity. Company also makes concrete block and septic tanks

THE RAPID GROWTH of Houston, Texas, has created a demand for concrete sewer and culvert pipe which has kept local producers extremely busy. Not only is pipe needed for new construction but many old sewers in the city proper are being replaced with larger capacity pipe. In addition to the city work, several war plants have been constructed in this area which also required a large quantity of pipe.

One Houston plant which has increased production to meet this emergency is Black-Brollier, Inc. This company now operates two plants, Plant No. 1 started in 1936 and Plant No. 2 in 1942.

Plant No. 1 produces the smaller sizes of pipe with a Martin packer-head machine. Sizes made here are from 4- through 15-in. diameters and 3 ft. in length. A Champion drain tile machine makes sizes from 4- through 8-in. In addition to pipe production, this plant operates a Brooks-Taylor lime putty plant. Three 2-cu. yd. transit mixer trucks deliver ready mixed lime mortar.

At Plant No. 2, a model H118 McCracken packer-head machine was

installed in October, 1944. In addition to this machine, a Universal pipe machine produces larger sizes. The Universal machine can make sizes from 8- through 60-in., 4 ft. long, but is used primarily for the larger sizes while the McCracken makes the smaller sizes. The latter machine can make pipe from 4- through 30-in. diameters, 4-ft. in length.

The Universal machine is equipped with a 13-cu. ft. Stearns mixer located in a concrete underground pit. Transfer from the mixer to the machine is handled by a skip hoist. Rubber-tired off-bearing carts remove the pipe to curing sheds where they are water sprayed. For removal of large pipe a special cart is used.

Aggregates for the McCracken machine are deposited into a skip hoist for delivery to a 30-cu. ft. Besser mixer. After mixing, the concrete is discharged to an 18-in. belt conveyor, 15-ft. centers, for delivery to the machine. Rubber-tired off-bearing carts remove the finished pipe to curing rooms.

Pipe are transferred to the storage yard by rolling on wooden tracks



Framed inside large concrete pipe are, from left to right, George Black, vice-president; Lee Brollier, president; and Ernest Black, secretary-treasurer of the company

as shown in the illustration. This method of transference allows the pipe to be rolled in a straight line, since the bell does not touch the ground and thus tends to swing the pipe around.

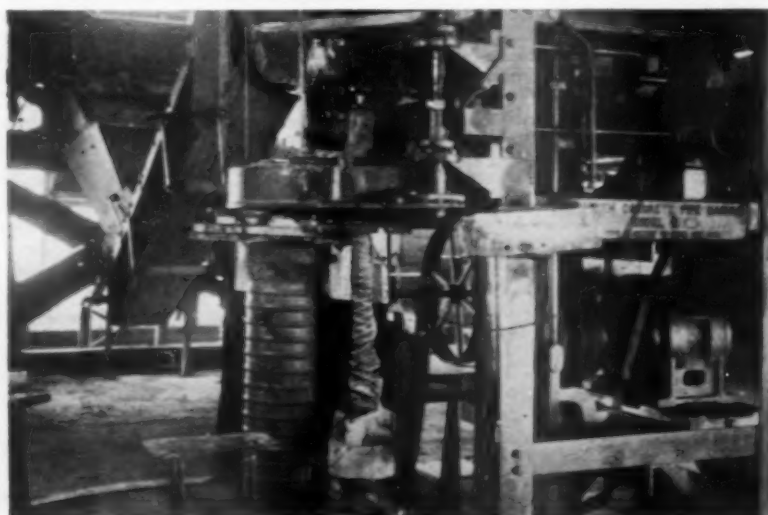
In addition to pipe, this plant produces septic tanks, stepping stones, foundation block, and concrete masonry units. A Stearns clipper stripper makes the concrete block. Delivery is made on tractor-trailers, 30 ft long, within a 200-mile radius from Houston.

Pipe, both reinforced and non-reinforced, are made under strict laboratory control. The finished product is subject to A.S.T.M., as well as State, City and County specifications.

Lee Brollier is president of Black-Brollier, Inc.; George Black is vice-president, and Ernest Black is secretary and treasurer. This company also handles building materials.



Pipe ranging in size from 8-in. to 60-in. can be made on this machine



Machine on which pipe from 4-in. through 30-in. diameter are made in lengths up to 4 ft.



... and now again!
Fourth "E" awarded
March 10, 1945.

*No other tamp-type machine
as a*

STEARNS CLIPPER STRIPPER

● **Production records demonstrate** that Stearns Clippers will produce more blocks per man per day than any other machine with comparable power operations.

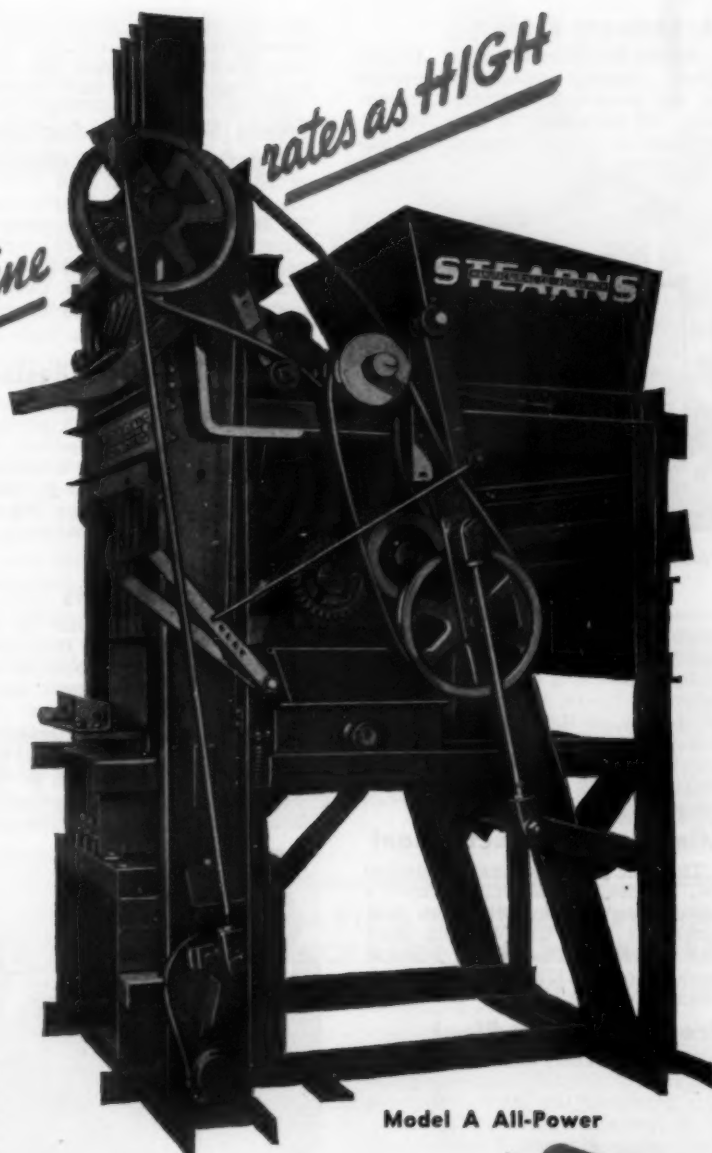
● **Four separate models** with power tampers ranging from manual feeding and stripping to all-power: Model E produces 100 blocks per hour—Model A, 240 per hour.

● **Interchangeable parts:** Starting with Model E you can, **without sacrifice**, make progressive additions of power equipment until you have all-power (Model A).

● **Outstanding features** include low first cost, low maintenance, adaptability, simplicity.

● **Cored pallets** are used.

*Write today for new Clipper folder describing
all four models and attachments*



rates as HIGH

Model A All-Power

*Performance
Speaks Louder
than Words*

ASK ANY
STEARNS OWNER

A FEW OF
HUNDREDS

CHARLES LORENZ
Port Huron, Michigan
Two Clipper Strippers

STRICKLER & WAGNER
Winchester, Virginia
One Clipper Stripper

VINCENT DeANGELIS
Hockessin, Delaware
One Clipper Stripper

STEARNS

GENE OLSEN, PRESIDENT

Also manufacturers of Jolterete Block Machines . . . Mixers . . . Skip Loaders.
Licensed under the basic Gelbman Vibration Patents.

Architects Exhibit

BESSER MANUFACTURING CO., Alpena, Mich., recently installed an exhibit at the Architects Samples Corporation, 101 Park avenue, New York, N. Y. Jesse H. Besser, president, in an-

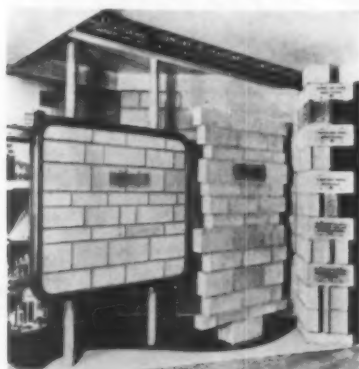


Exhibit demonstrates construction details for various types of concrete masonry

nouncing the exhibit, said that it was established for the convenience of architects, contractors, commercial builders, planning boards for city and federal projects, and home owners, as a part of the company's Public Information Service. A booklet, "Architect's Key to Concrete Masonry Exhibit" is distributed by the company.

Minnesota Products Plant

THE ELK RIVER CONCRETE PRODUCTS Co., Minneapolis, Minn., will open a branch at Windom, Minn., on land purchased from the Windom Sand and Gravel Co. One of the principal products of the Elk River concern is concrete culvert pipe.

Proposed Block Plant

W. H. SCHULLER, Vancouver, Wash., is planning to build a concrete products plant on the Pacific Highway about four miles north of Vancouver. The County Planning Commission is to pass on a permit.

Concrete Ballast

SHIP BALLAST on the Pacific Coast is being made from a magnetite ore,

running up to 65 percent iron obtained from a deposit near Lovelock, Nev., which is crushed and mixed with magnetic sands and cement.

Triple Block Production

HOKE CONCRETE CO., Raeford, N. C., owned by Hoke Oil and Fertilizer Co., has been granted priorities by W.P.B. to purchase new block machinery and make other improvements in plant to cost \$80,000. According to President T. B. Upchurch, production of concrete products will be tripled.

Absorb Products Business

WAUPACA CONCRETE PRODUCTS Co., Waupaca, Wis., has been purchased by Madison Silo Co., Madison, Wis., and will be continued as a branch of the Madison concern. A. E. Woody, formerly president of the Waupaca company, will be co-manager with Julius Johnson.

California Reports

PRODUCTION of cement in four southern counties in California amounted to 8,167,726 bbls. in 1944, or 56 percent of the total for the state. State production was down nearly 4,000,000 bbls. over 1943. State production of gypsum in 1944 was 558,488 tons, an increase of 80,000 tons over 1943.



Group at wedding of Ensign Gene D. Olsen. Left to right: C. E. Ehle, vice-president, Cleveland Builders Supply Co.; Mrs. E. F. Olsen; Ensign Gene D. Olsen, director, Stearns Manufacturing Co., Inc.; and the bride, Mrs. Olsen; Gene Olsen, president of Stearns Manufacturing Co., Inc.; Mrs. C. E. Ehle; and E. W. Dlenhart, executive secretary, National Concrete Masonry Association

New Products Concern

SIKESTON CONCRETE PRODUCTS Co., Sikeston, Mo., is the name of a new concern which is being organized to make concrete block. This concern is being set up to furnish concrete masonry for the Harvey Parks Airport buildings.

Cement Contract

SUPERIOR PORTLAND CEMENT Co., Seattle, Wash., has been awarded a \$21,293 contract for 7000 bbls. of cement to be used for the construction of canals and other irrigation works on the Roza division of the Yakima project in south central Washington.

Furnishing Ready Mix

DOUGLAS COUNTY GRAVEL Co., Valley, Nebr., is now supplying ready mixed concrete. R. S. Yant, owner, is merchandising concrete to farmers in the immediate area as well as the city.

New Products Plant

CONCRETE PRODUCTS Co., Houghton, Mich., is a new concern which will be headed by E. M. Laitala as manager. When a new building has been erected, the plant will make concrete block, concrete burial vaults, and will sell ready mixed concrete.

THE POWER Lift Truck

Ericksons have stamina, power, speed and maneuverability. Big pneumatic tires on drive wheels. No paved runways required. All steel welded construction. Speedy hydraulic platform raiser. Simple controls. Write for complete details.



ERICKSON LIFT TRUCKS

For Fast Movement of Large Quantities of Block

ERICKSON SPECIAL EQUIPMENT MFG. CO.

109 14TH AVE. N. E.

MINNEAPOLIS, MINN.

The "Quinn Standard" FOR CONCRETE PIPE



The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

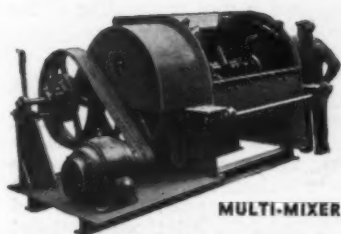
For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY

Complete information, prices and estimates sent on request. Also manufacturers of Quinn Concrete Pipe Machines.

QUINN WIRE & IRON WORKS 1603 12th ST. BOONE, IA

MULTIPLEX BLOCK-MAKERS FOR LARGE VOLUME PRODUCTION



MULTI-MIXER

... with reverse screw-type action insures fast and thorough mixing of every batch. This is the machine for an "assembly line" uniform product at all times. Sizes 5 to 60 cu. ft. and larger.

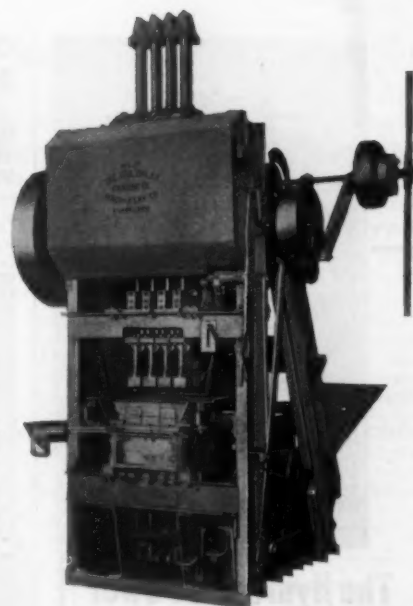
- THE MULTIPLEX COMBINATION**
- Beauty in Block
 - Low Cost Production
 - Simple Operation

MULTIPLEX SUPER-TAMPERS

With this high production machine your plant will consistently produce perfectly finished brick, tile, or block units on a low cost and maintenance basis. Many manufacturers have built strong reputations on this machine.

The Multiplex Super Tamber has 8-bar tampers, positioned-timed feeding and stripping, and quick action 5-point clutches. It handles all kinds of aggregates and produces 4 to 6 top quality units per minute.

The Multiplex Super Tamber is engineered and built for a lifetime of trouble-free service. It is the ideal economy post-war block-maker.



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FOR
CATALOG No. 31**

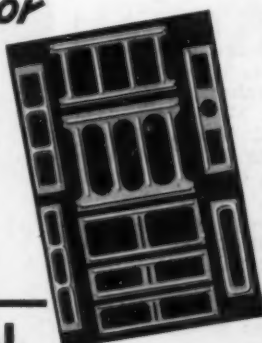
describing these and other Multiple Machines for the complete concrete products plant.

**MULTIPLEX CONCRETE
MACHINERY**
ELMORE, OHIO



VITAL for MAKING PERFECTLY FORMED CONCRETE BLOCK

COMMERCIAL CORED STEEL PALLET



*The "Backbone"
of Concrete
Block Production*

The pallets you use can mean the difference between just possible and high-quality concrete block. When you use **COMMERCIAL** Steel Pallets you can be absolutely sure of getting perfectly formed, sharp-edged block. Furthermore, **COMMERCIAL** Steel Pallets assure more uniform and quicker curing of the green units, maximum rock and maximum kiln capacity. The ribs pressed into **COMMERCIAL** Steel Pallets impart both strength and mortar grooves into the bottom of the concrete block. Lightweight, indestructible and warp-proof, **COMMERCIAL** Steel Pallets are the backbone of high quality block production.

Write today for a catalog

**The COMMERCIAL SHEARING &
STAMPING COMPANY**
YOUNGSTOWN, OHIO

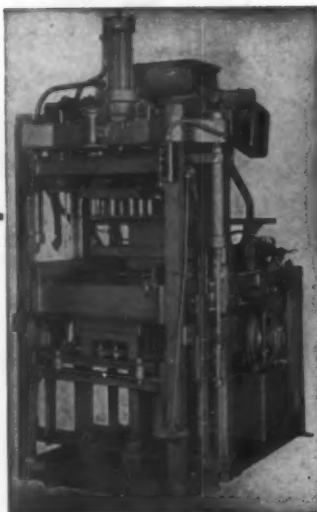
THE LEADING MANUFACTURER OF LIFT TRUCK RACKS AND BLOCK CARS for the Concrete Products Industry



● Style 294 Hinged Deck Lift Truck Racks in block plant of Cleveland Builders Supply Co., Cleveland, Ohio.

**ANY STYLE OR DESIGN LIFT TRUCK RACK
OR CAR FOR YOUR PLANT**

THE CHASE FOUNDRY & MANUFACTURING CO.
COLUMBUS 7, OHIO



The Hydraulic Power BLOCK MAKER

Hydraulic power makes the Kent-Root Vibra-Press a more efficient, longer lasting machine. Its smoothness of action insures long life and low maintenance costs while producing perfect block. Vibration within full floating mold box and full floating cores.

WRITE, WIRE OR CALL
FOR COMPLETE DETAILS



THE KENT DUNKER Pallet Cleaner and Oiler

This patented Dunker keeps pallets in prime condition at all times. Just hang the pallets on the pins and as they are taken off for use the spider rotates by gravity passing the pallets through the tank. You can use discarded crank case oil from your trucks in the Dunker tank.

The KENT MACHINE CO.

Cuyahoga Falls, Ohio

Organize a New Burial Vault Association

CONCRETE burial vault manufacturers of the Midwest have organized The American Institute of Burial Vault Manufacturers, Inc., with headquarters in the Congress Building, Kansas City, Mo. The initial meeting was held in Joplin, Mo., April 8, and



R. D. Edson, executive secretary of new association

elected the following officers and members of the Board of Directors: President, Jack Linville, Coffeyville Vault Co., Coffeyville, Kans.; vice-president, Rex Elledge, Perfected Mausoleum Vault Co., Trenton, Mo.; treasurer, Paul Graham, Graham Vault Co., Sedalia, Mo.; recording secretary, Joseph E. Myers, Myers Vault Co., Webb City, Mo.; William D. Jackson, Kansas City, Mo.; and executive secretary, R. D. Edson, Kansas City, Mo.

Membership is limited to those manufacturers whose vaults and business ethics meet the requirements of the Institute. Foundation and associated memberships in the Institute are limited to those firms and individuals supplying materials necessary in the manufacture of concrete vaults. To further inspire public confidence and acceptance in the concrete vaults manufactured, the Institute has made arrangements with an insurance company to issue an insurance policy on all vaults sold by the members, according to Executive Secretary R. D. Edson.

The Institute will set up a department to compile information concerning new materials and methods used in the manufacture of burial vaults. A Merchandising and Advertising Committee has been appointed to establish merchandising policies for the organization, and it was decided to spend an amount equal to half of the total national advertising fund in the members' own territory.

National advertising will be carried over the insignia of the American Institute of Burial Vault Manufacturers, Inc., along with the affiliate member's name in each territory.

Chicago, Ill., has been selected by the convention committee for the first national convention to be held in January, 1946, providing O. D. T. regulations permit the holding of the meetings.

Materials Firm Sold

KENYON BUILDING MATERIALS Co., Bremerton, Wash., has been sold, and under a new incorporation will be known as Kenyon Materials Co. The officers include Mott Rieke, Norman W. Tracy, James W. Sullivan, and W. F. Paddock. All those identified with the new company are associated in the ownership of the Bremerton Concrete Products Co. Plans for development are under consideration, but will hinge on an easing of government restrictions.

Sell Yosemite Equipment

YOSEMITE PORTLAND CEMENT COMPANY's plant equipment at Merced, Calif., recently acquired by Kaiser interests, has been sold to Empressa Siderurgica Co., Colombia, South America. All movable buildings and equipment will be dismantled and shipped to Colombia where a plant will be set up 300 miles in the interior.



"ANCHOR"

Complete

EQUIPMENT AND ENGINEERING SERVICE

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mch. Co.

1191 Fairview Ave., Columbus 8, Ohio

FOR PERFECT SPREADS USE A BAUGHMAN

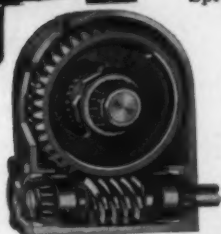
The machine that made LIME popular!



Patented
and Patents
Pending.

View of a 6½ ton load in a 11-foot body.

View of our heavy, cut steel and bronze, 15 to 1, Gear Reduction. All gears are straddle mounted between Timken tapered roller bearings, sealed against dirt and running in a bath of oil. Simple, efficient, trouble-free — will give years of service.



BAUGHMAN ALWAYS SETS THE PACE!

Here is the all-around machine you have been waiting for — put it on your truck and use it the "whole year 'round." Spreading lime is only one of the many jobs this model will do!

MODEL K Wide Throat Drag Chain Type

Steel Body and Undercarriage. Capacities, 5 to 15 tons. Made in 9, 11, 13, 15 and 17 lengths — and 19, 21, 23 and 25 foot lengths with sideboards.

Handles wet or dry lime. Timken straddle mounted bearings, ball and roller bearings throughout. Only two oil-sealed cases and 1 short roller chain drive. Automatic chain feed regulator. Automatic endgates — large endgate for fast dumping. New style automatic drag chain tightener with anti-wrap chain stop. Only 1 patented distributor used. Spreads from 35 to 45 feet depending upon truck speed.

Other Baughman

"Hi-Speed" Equipment

Model C, Cinder and Chip Spreader
Model N, Dump Body Line Spreader
Model P, Phosphate Spreader
Motor or Farm Tractor Drive Spreader
Model F, Flat Bed Type Spreader
Model J, Transfer Unloader or Dump
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Ask for recommendations—we have a reliable distributor near you.

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DOUBLE your tractor's usefulness with a HYSTER DOUBLE DRUM



Sold and Serviced by
"Caterpillar" Dealers
Everywhere.



used for the haul-back line. With two speeds and ample pull available on both drums, with anti-friction bearings used throughout — each free-rolling drum delivers maximum power.

See your "Caterpillar" dealer about these HYSTER Double Drums that double your tractor's service ability — and get more jobs done.

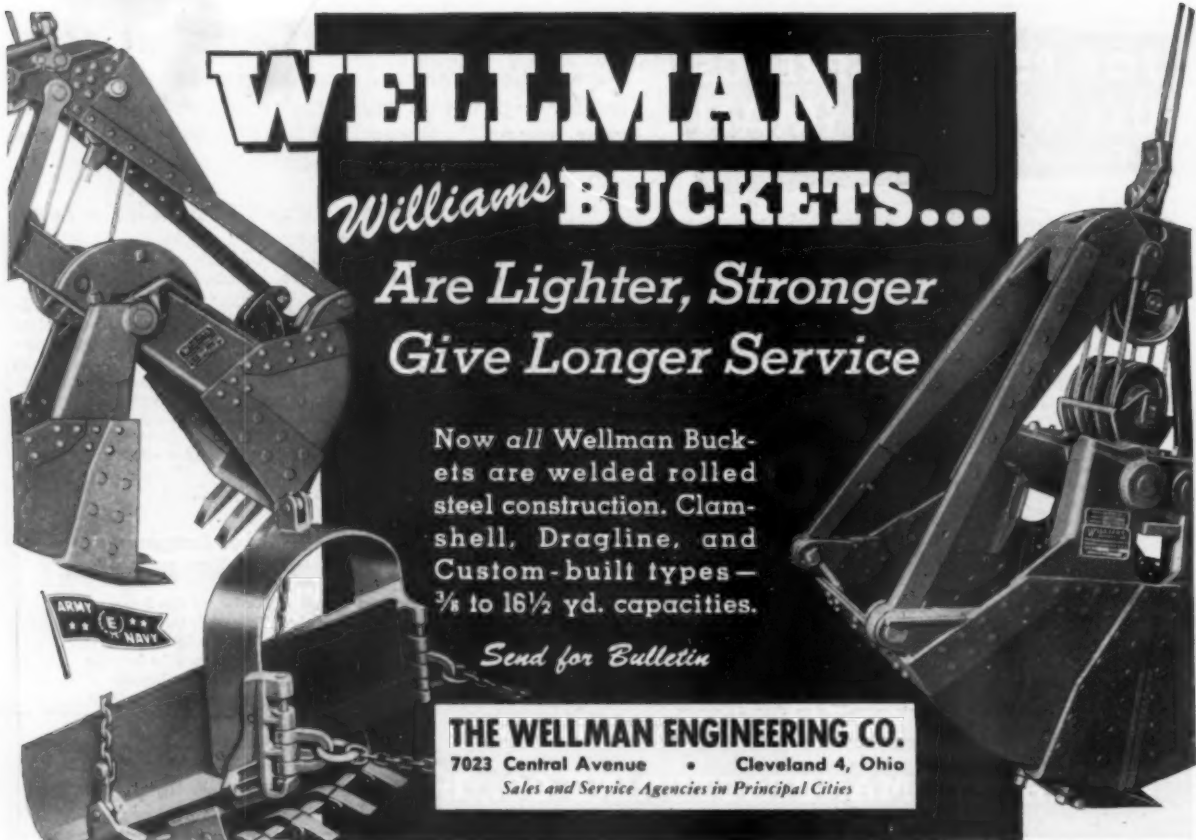
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WORLD'S LARGEST MANUFACTURERS OF TRACTOR HOISTS AND WINCHES



WELLMAN

Williams BUCKETS...

Are Lighter, Stronger Give Longer Service

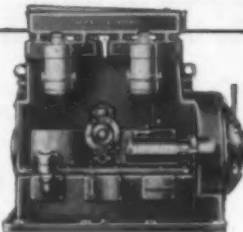
Now all Wellman Buckets are welded rolled steel construction. Clamshell, Dragline, and Custom-built types— $\frac{3}{8}$ to 16 $\frac{1}{2}$ yd. capacities.

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THE WELLMAN ENGINEERING CO.
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Sales and Service Agencies in Principal Cities

Powerful, Compact, Safe, Lightweight FOR MECHANICAL DRIVES

*or Direct Connected to Generator in
Climax 15 and 30 kva Generating Sets*



CLIMAX DIESELS
22 and 44 maximum h. p.
(at 1200 rpm)
2 and 4-cylinder

MODEL D297 CLIMAX DIESEL ENGINE
MAXIMUM RATING 44 H.P.

HERE is more power—more dependable, low cost power—for stationary or portable industrial or marine service than is commonly available in a small, space-saving package. Climax Diesels are strongly built with one piece construction of cylinders and crankcase. They are 4-stroke-cycle type, solid injection, compression ignition engines that start instantly and operate smoothly on cheap, standard grade fuel oil. Standard equipment includes American Bosch fuel pump and injection

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QUICK REPAIRS RIGHT ON THE JOB

Don't let breakdowns mean long lay ups! Repair-weld your equipment on the job. Do it in a few hours—save days required to obtain replacement parts.

You can prolong the life of your equipment indefinitely—by building up and hard-surfacing with P&H Welding Electrodes. P&H welding engineers will be glad to help you as to the type to use and procedure to follow. The complete P&H line of welding electrodes includes a size and type for every requirement—for repair-welding; or for building up and hard-surfacing to provide unusual resistance to wear, impact and abrasion.

TODAY call your nearest P&H representative—he's ready to help you. Or if you wish, write us for complete-line booklet.

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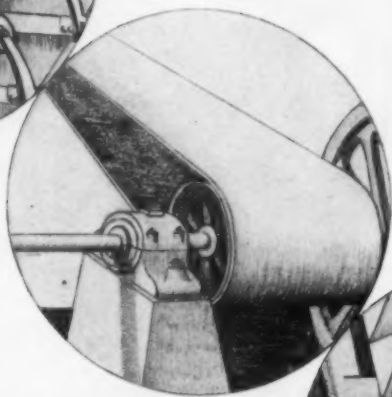
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WELDING ELECTRODES • MOTORS • PUMPS • ELECTRIC CRANES • ARC WELDERS • EXCAVATORS

GOODALL *Quality* CUTS BELTING COSTS

*A Variety of Constructions
for Every Job*

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"Triple-S" Brand: For the longest, heaviest, hauls . . . ores, crushed limestone up to 8", rough slag, run-o'-mine coal, hot materials, etc. "Goodall" Brand: For lighter materials such as crushed stone, gravel, coal (not run-o'-mine), ashes, salt, shells, etc.



TRANSMISSION . . .

"Power King": Raw edge belting for hardest service. Extra heavy construction—33 to 35 oz. silver hard duck. "La Crosse": 32 oz. duck. "Osage": 28 oz. duck.

ELEVATOR . . .

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BUY More Bonds . . . and KEEP Them!

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Factory—Trenton, N. J.

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"SPEED MERCHANT," ANY OTHER
TRUCK MIXER IS 5 YEARS OLD

2 CU. YD.



THESE FEATURES ARE OBSOLETE TODAY

- Movable Hoppers and Hopper Seal Troubles
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"HI-DUMP" OR "LOW CHARGE": The improvements shown in these HI-DUMP models are also available in "LOW CHARGE" types up to 5½ cu. yd. sizes.



4½ CU. YD.

If you want the public to know that you intend to maintain up-to-date "ready-mixed" service in your community, the quickest way to tell them is to put one of these 1945-model Jaegers on the street. In appearance, in construction and in speed and efficiency of operation, they make previous truck mixer designs completely out-of-date. Talk to your Jaeger distributor or write us for new Catalog TM-5.

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Quarry to Plant

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ECONOMY AND SPEED

is the keynote in handling rock in this modern rock quarry.

Continental belt conveyors are meeting the demands for more and more rock—day in and day out.

Whether you need a single replacement idler or a complete installation, Continental can fill your requirements. All types of accessories, such as pulleys, bearings, take-ups, hold-backs, speed reducers, belt cleaning brushes, V-belt and roller chain drives can also be furnished.

Call on Continental!

Industrial Division

CONTINENTAL GIN COMPANY

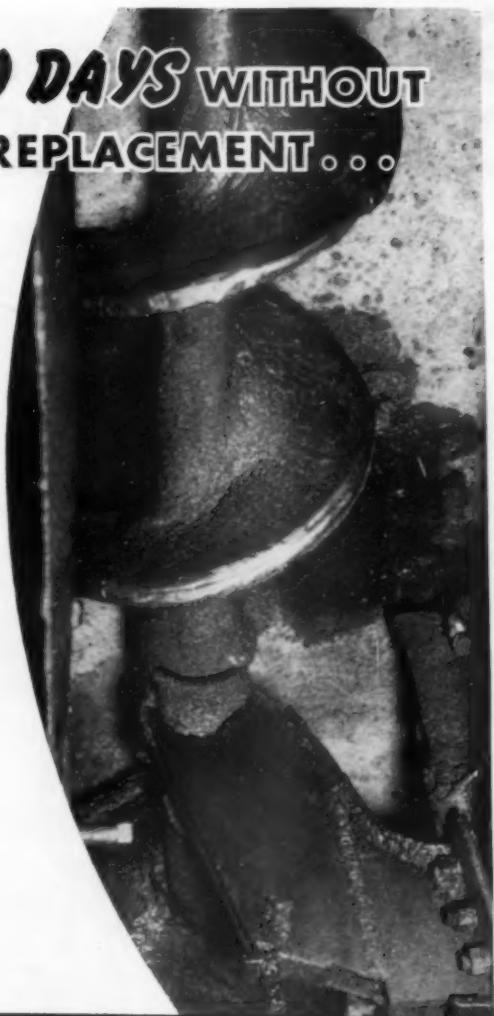
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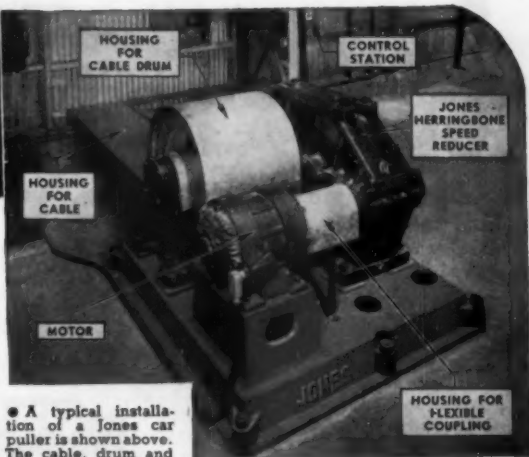
For spotting your cars. JONES CAR PULLERS

YOU will be surprised how much time can be saved in the spotting and switching of cars by using a Jones car puller. These sturdy, compact units will speed up car handling to the point where they soon pay for themselves in the saving of time and labor.

These car pullers are built by Jones as complete units with motor included if desired, or with base to take standard motor, as supplied by the purchaser. The cable drum is driven by a Jones triple reduction Herringbone speed reducer and the control station may be located at a point to give the operator a clear view of the tracks and spotting positions.

Even in plants where comparatively few cars are handled it has been found that a Jones car puller more than pays its way. Prices and complete information will enable you to judge whether such an outfit might pay out in your plant. Write for complete information.

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4447 Roosevelt Road, Chicago, Illinois



● A typical installation of a Jones car puller is shown above. The cable, drum and couplings are enclosed by sheet metal housings as an extra precaution in this installation to eliminate all hazard from moving parts.

● A complete Jones car puller unit. These outfits are for use with wire rope and are manufactured in a wide range of capacities to suit the number of cars to be handled in each plant.



Jones

HERRINGBONE—WORM—SPUR—GEAR SPEED REDUCERS
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES
ANTI-FRICTION PILLOW BLOCKS • PULLEYS
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|Air Compressors |Equipment |plies |Pulverizers |Trucks, Industrial |
|Air Separators |Concentrating Tables |Electric Motors |Pumps |Trucks, Mixer Body |
|Asphalt Mixing Plants |Concrete Mixers |Engineering Service, |Scales |Trucks, Motor |
|Bagging Machines |Concrete Mixing |Consulting and De- |Screen Cloth |Vibrators |
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|Bin Level Indicators |Cranes |Gypsum Plant Ma- | | |
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DOUBLE *Your Truck* CAPACITY

... GET AMPLE TRACTION
OVER THE ROUGHEST GROUND

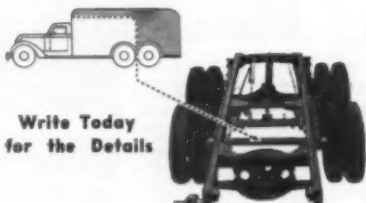
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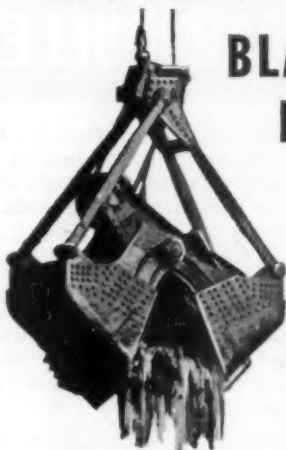


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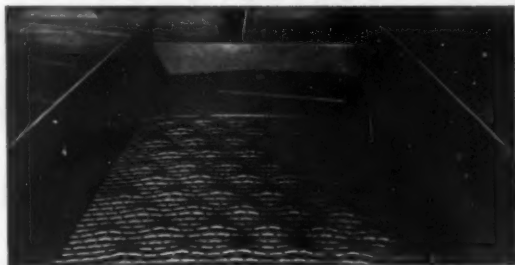
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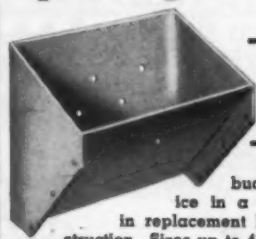
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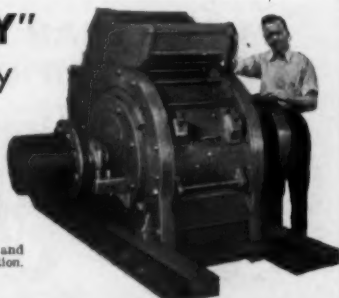
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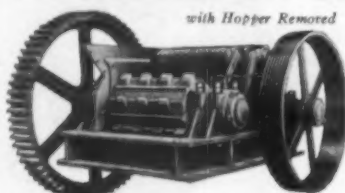
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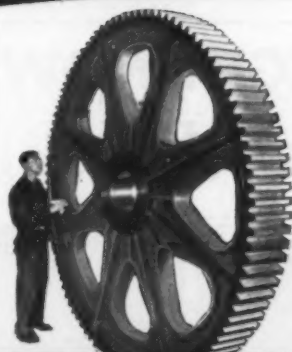
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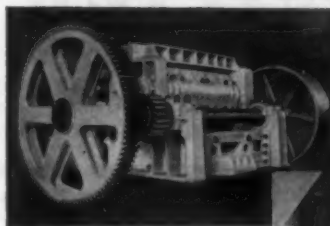
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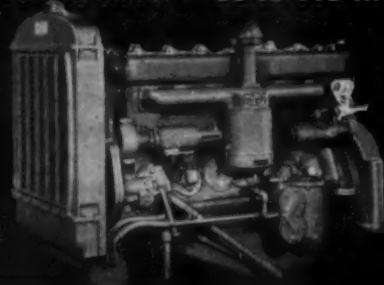


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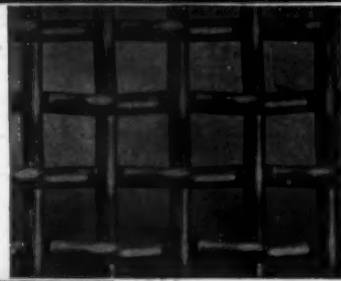
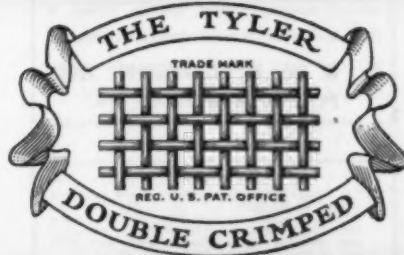
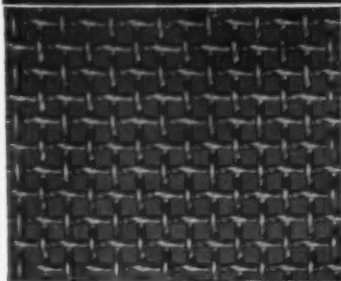
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42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
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14" - 6	8" - 6	4" - 5
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1 1/2"	50 "	12.00
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	35 "	10.00
	50 "	14.00
		20.00

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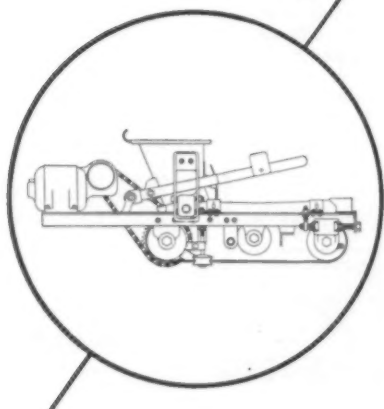
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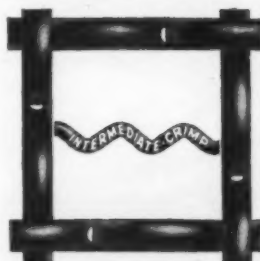
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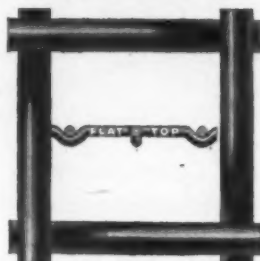
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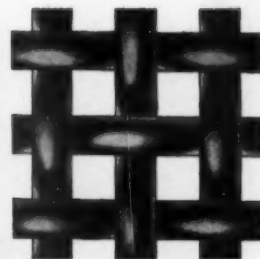
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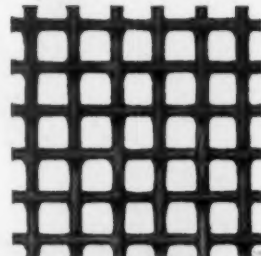
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Commercial Phosphor	Rek-Tang	Forming	Panels
Copper	Selva-Edge	Framing	Pieces
Monel Metal	Straight-Warp	Galvanizing	Racks
Nickel	Stranded	Painting	Ribbons
Any special alloys available in rod or wire form	Sta-Tru	Slitting	Rolls
	Twisted	Shearing	Sections
	Twisted-Fill	Slicing	Segments
	Twisted-Warp	Arc-Welding	Spacers
		Gas-Welding	Strips
		Spot-Welding	Template shapes
			Trays

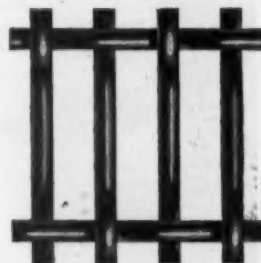
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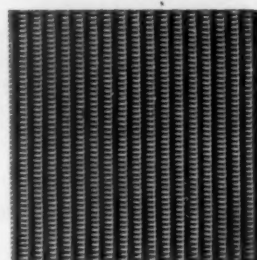
Double-Crimp



Galvanized



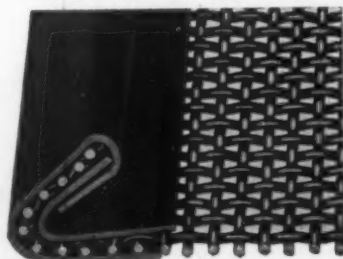
Rek-Tang



Dutch Weave

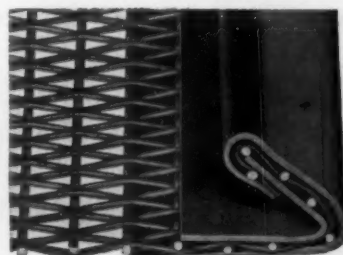
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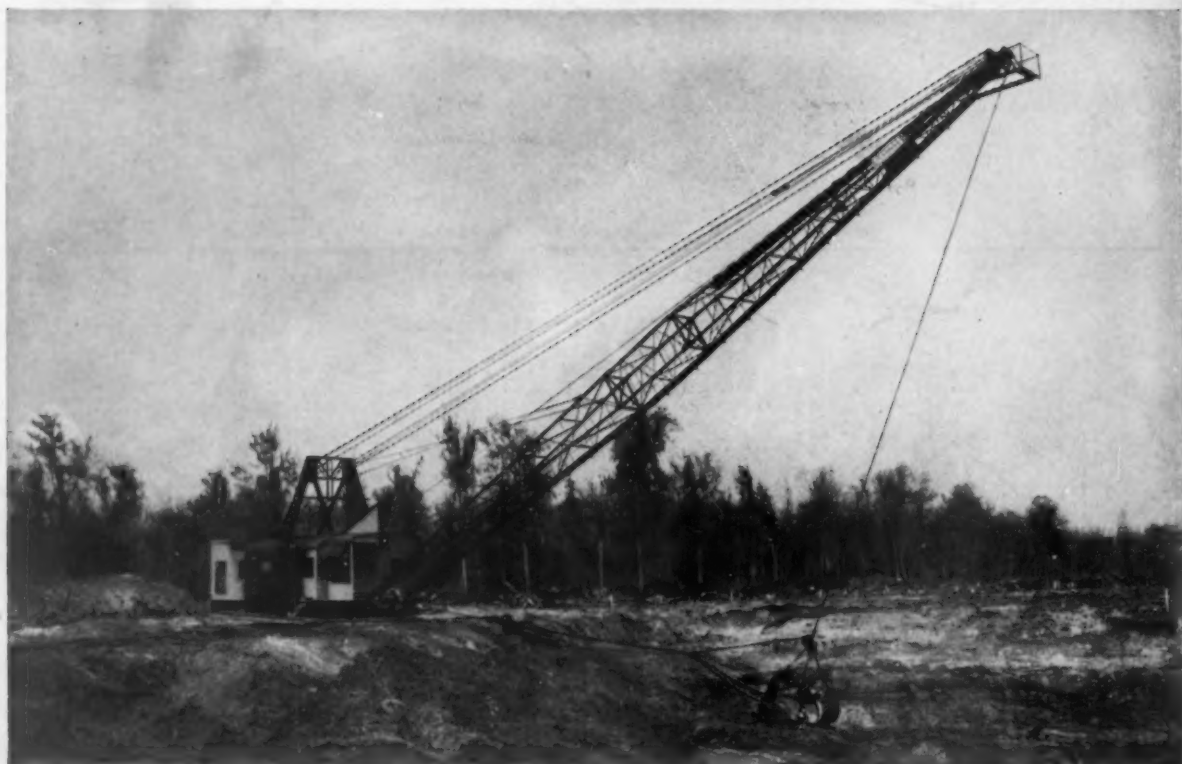
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